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Dental Digest

Fifty-fifth Year of Publication

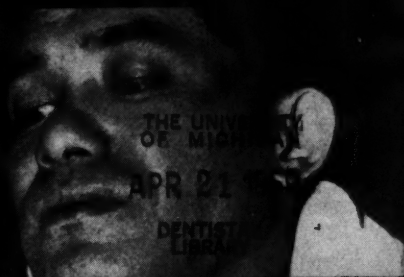
April 1959

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APRIL 1959

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A Clinical Application of HYPNOSIS and HYPNOANESTHESIA in Dentistry—Part One

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Fargo, North Dakota

DIGEST

Alleviation of pain in dentistry has long been a concern of dentists. The use of chemical anesthetics is a genuine boon but while progress is continuous in this direction, it is doubtful that all dental discomfort will ever be eliminated. Because apprehension is one of the major reasons for neglecting dental treatment, the induction of hypnotic sleep is a valuable anesthetic aid. This article presents a broad survey of the subject of hypnosis in dentistry, including definitions of terminology, possible applications in particular situations, and technical knowledge drawn from the author's experience. This is the first of a series of three articles.

General Effects of Tension

Tension, fear, and anxiety are the human emotions most commonly observed in patients coming to the dental office. This condition is also found in some medical patients. Study of these patients in the hospital and the office revealed how tension affects both as shown in the graph.

Variation in Emotional Patterns—

In the medical patient tension arises quickly until a phone call is made for an appointment with the physician. After the phone call, tension seems to taper off to a point slightly above normal when he enters a physician's office for his first consultation. The tension will then rise or disappear depending on the reception, diagnosis, and treatment by the physician. If the patient feels that he will be helped by the physician he shifts the complete responsibility for his health to his physician.

The Pattern in Reverse—In the dental patient there is only a slight rise of tension upward until the call for an appointment is made. After the appointment is made, the tension

in this patient rises rapidly and may be expressed: "Oh, I have an appointment with my dentist Thursday at 10:00. I wish I didn't have to go. I just hate it." In the dental office, tension will continue to rise or fall depending on the reception, treatment, and care offered by the dentist.

Emotional Patterns in the Dentist

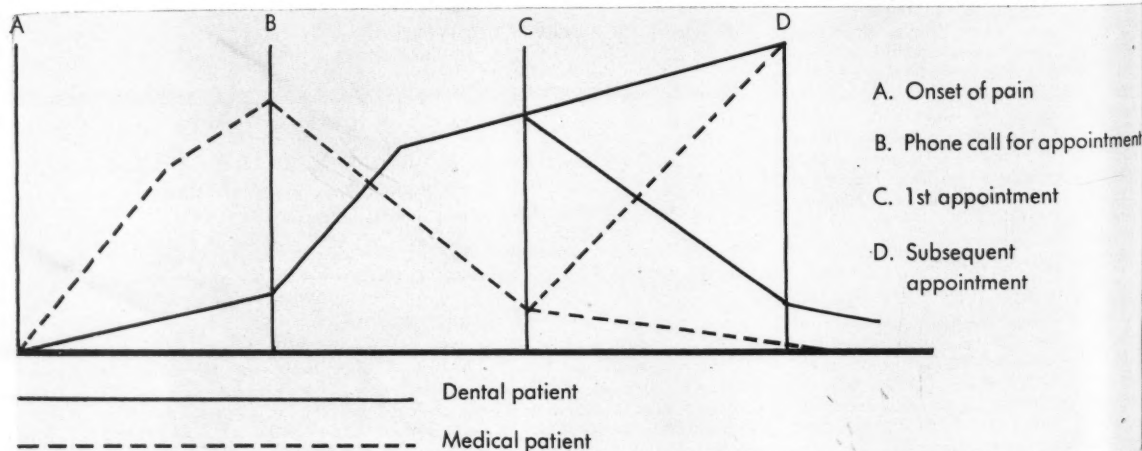
—Influenza, gastric disorders, and eye strain are commonly considered the occupational hazards of dentistry. Bernstein and Balk¹ examined 56 dentists at the Newark Clinical Group. These physicians found that dentists showed no significant differences compared to other patients examined, except in regard to anxiety states and cardiovascular conditions:

(1) 42.1 per cent of the dentists were diagnosed as suffering from anxiety as against 12.3 per cent for other patients.

(2) Dentists showed 30.5 per cent suffering from cardiovascular diseases

*Clinical Instructor in Surgery, Department of Surgery, Medical School, University of Minnesota.

¹Bernstein, A., and Balk, J. L.: Common Diseases of Practicing Dentists, JADA 46:525 (May) 1953.



as against 18.3 per cent for other patients.

(3) The investigators conclude that anxiety is the chief occupational disease of dentists.

Contributing Factors — Standing beside tense, anxious, and apprehensive patients hour after hour might be a significant factor in the production of tension in the dentist.

Definitions

In the field of hypnosis there are many theories and even more misconceptions. Any discussion on the subject can easily become confusing without a preliminary definition of terms and concepts.

A Suggestion — This is an idea which is accepted uncritically by the recipient. The idea may come from the subject himself (autosuggestion), or it may come from an outside source (heterosuggestion).

An accepted idea implying action will typically produce that action in the recipient. If the idea implies sensation, a sensory-like experience is likely to be present in the person. (For example, hallucination.)

Hypnosis is an artificially induced psychic state resembling sleep (though not always) in which some of the activities of the brain are either reduced or suspended, and is characterized by the hypersuggestibility of the person and by his increased power to act upon and carry out suggestions.

Rapport is the interpersonal relationship that exists between patient and dentist.

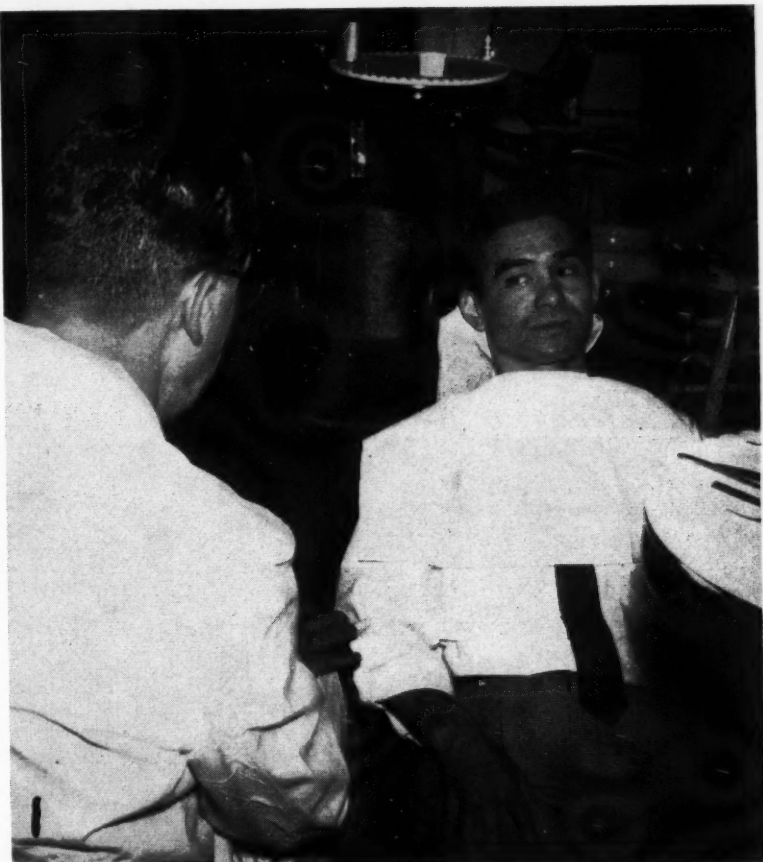
Concepts of Hypnosis

The precise nature of the changes occurring in the patient when he goes into the hypnotic state is not as yet fully understood.

Extent of Suggestibility—It is generally accepted that all normal human beings above the age of 4 or 5 are suggestible.

Meaning of Suggestibility — As stated, a suggestion is an idea which is accepted uncritically by the recipient. Although usually given verbally, this idea can be given by a gesture or any other means of communication.

Characteristics of Hypnotic State—



1.

Establishment of rapport. The hypnotic state is explained to the patient. He is told how he will go to sleep; how he will awaken; and what he is to expect. (Photographs courtesy of Department of Surgery, Medical School, University of Minnesota.)

In the hypnotic state a subject is even more than normally inclined to accept ideas unquestioningly. This is because the hypnotic state is characterized by an attitude of uncriticalness, passivity, lethargy, and lack of resistance. The skill of the clinical hypnotist lies in his ability to promote such a passive attitude in his patient who may accept and act upon ideas to which he might show resistance in a non-hypnotic state.

Suggestibility Normal Phenomena — Since the skill of the clinical hypnotist lies in his ability to promote the attitude of acceptance in the patient, hypnosis may be said to belong to the normal phenomena of human life. A good deal of waking time is spent in trying to induce other people

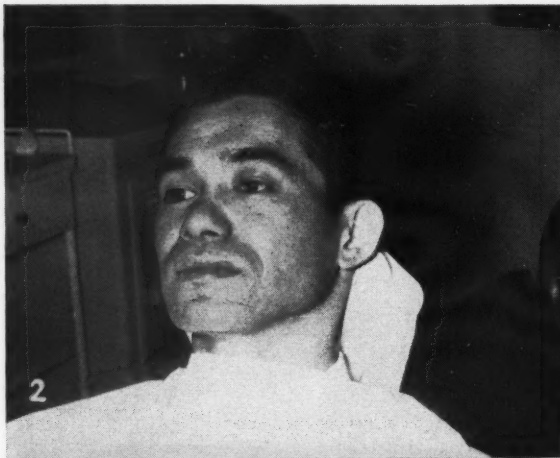
to accept ideas, in order to control certain aspects of their behavior. Obviously the less resistance aroused when an idea is being presented, the less effort is required and the more likely is the suggestion to be acted upon.

The Principles of Hypnotic Induction

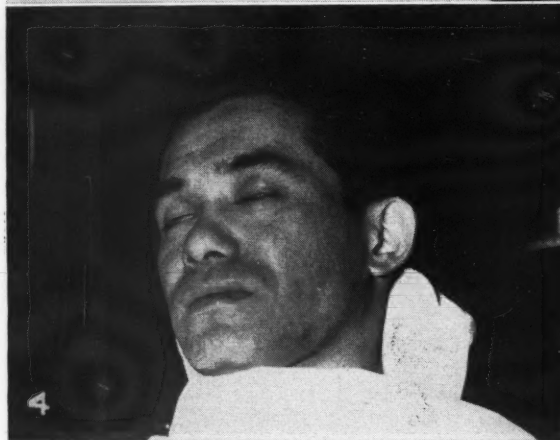
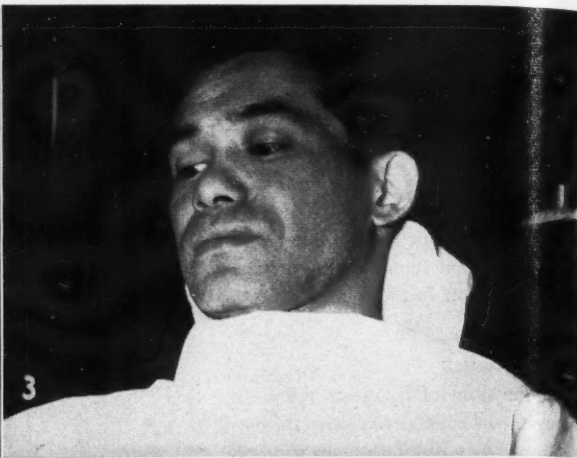
Underlying the technique of hypnotic induction are several necessary conceptions:

- (1) The characteristics inherent in the patient
- (2) The qualifications required of the hypnotist
- (3) The specific techniques used by the hypnotist

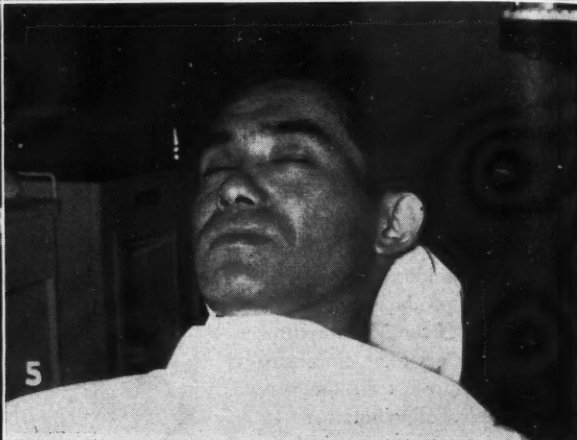
Qualifications of the Patient — A



2. Induction has begun. Note the look of concentration on the patient's face.



3. Patient is now gazing on his lap. Eyes are beginning to close.



4. Patient has just entered the hypnotic state. Note that the eyeballs are turned upwards.

5. Patient is now in a deep state of hypnosis. Note the relaxed facial expression.



6. Patient is being taught anesthesia. He is told that the hand is numb. He is being touched with the dull end of the explorer and told that this will be the feeling of numbness.



7. The patient is told that his teeth and gums are numb. Although he will feel the hands of the operator and the instruments as they touch his tissues there will be no pain. The patient is assured that noises will not bother him and that he will be relaxed during the entire procedure. The cavity preparation is begun.



8.
Cavity preparation.

satisfactory hypnotic subject must (1) be able to concentrate his attention. If he does not attend to what the hypnotist is saying to him, both are wasting their time. Extremely young children, the feeble-minded, and many psychotic persons are unable to focus their attention. Consequently they usually are poor hypnotic subjects.

(2) The patient must have some imaginative power. When asked to imagine, he must be able to do so. Children on the average have more vivid imaginations than adults. They are particularly good hypnotic subjects if they are able to control the attention. The person whose mind is so inactive that it never imagines, or one who is convinced that he must always deal with physical reality, will not make a good hypnotic subject.

(3) A power of concentration and the ability to imagine denote intelligence. An important element of intelligence, however, is the ability to comprehend and follow directions. This ability is a requirement in a good hypnotic subject.

(4) The patient must be willing to be hypnotized. When hypnosis is properly explained most dental patients are willing and even eager to

accept it because they wish to have dental procedures facilitated in comfort.

Hypnotic Techniques

The hypnotic state may be induced in several ways:

(1) *Suggestion*—Suggestions are made that the patient enter the hypnotic state. These usually are made

verbally; however they can be visual: for example, written suggestions.

(2) *Concentration*—The patient is induced to concentrate on a thought or action.

(3) *Eye Fixation or Fascination Method*—The eyes are impelled to stare at a shiny object, a light, a swinging pendulum, or even the eyes of the hypnotist. This may produce fatigue so that the subject will enter the hypnotic state. Verbal suggestions are sometimes made by the operator that the subject enter the hypnotic state while the eye-fixation method is being used.

(4) *Mechanical*—Pressure on the conjunctiva along with verbal suggestion that the subject enter the hypnotic state. Verbal suggestions that the subject enter the hypnotic state as pressure is being applied on the carotid sinus. *Mechanical induction of hypnosis is not recommended because it is considered dangerous.*

(5) *Sound Vibrations*—A monotonous rhythmic sound produced by a mechanical device is sometimes employed.

(6) *Complete Absence of Sound*—The sensory centers of the brain may be lulled into non-function from cessation of use.

(7) *Chemical*—The administration of hypnoidal drugs such as barbitu-

Hypnosis as a Therapeutic

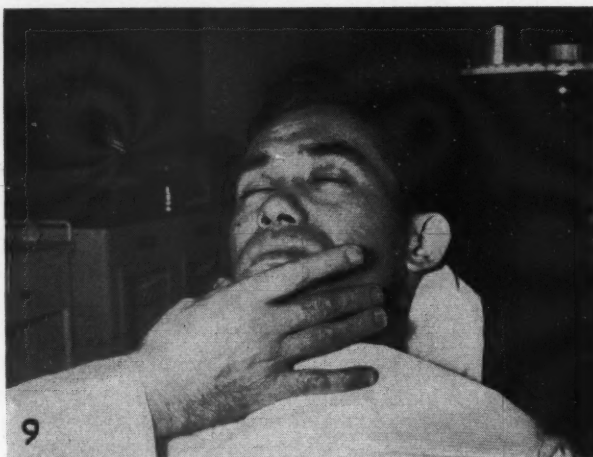
General Practitioners, medical specialists, and dentists might find hypnosis valuable as a therapeutic adjunct within the specific field of their professional competence. It should be stressed that all those who use hypnosis need to be aware of the complex nature of the phenomena involved.

Teaching related to hypnosis should be under responsible medical or dental direction, and integrated teaching programs should include not only the techniques of induction but also the indications and limitations for its use within the specific area involved. Instruction limited to induction tech-

niques alone should be discouraged.

Certain aspects of hypnosis still remain unknown and controversial, as is true in many other areas of medicine and the psychological sciences. Therefore active participation in high-level research by members of the medical and dental profession is to be encouraged. The use of hypnosis for entertainment purposes is vigorously condemned.

From Council on Mental Health, *Journal of the American Medical Association* 168:187 (Sept. 13) 1958.



9.
The salivary glands are touched as patient is told to swallow and to stop all saliva from flowing to the mouth.



10.
Band in place, yet the mouth is free of saliva.

rates, scopolamine, sodium pentothal, nitrous oxide, ether and others accompanied by the verbal suggestion that the subject enter the hypnotic state is sometimes effective.

The Procedure of Hypnotic Induction

After the patient is prepared psychologically for the procedure, the following steps are taken:

1. The patient is seated in the dental chair. If she is wearing high-heeled shoes, they are removed. A pair of gymnasium paper slippers are substituted.

2. The patient is then requested to:

(1) Place hands upon lap and make

no movements of any kind unless those movements are suggested, (2) fix the gaze upon the hands so that outside events will not be distracting, and (3) concentrate on the idea that hands and arms are becoming completely rested.

3. The operator speaks in the following terms:

"You will imagine that when I count to 5 your arms and hands will become completely relaxed and rested. You will now imagine that your legs and feet and the rest of your body are relaxed as I count to 5.

"You will imagine that when I count to 10 you will close your eyes and go into deep hypnotic sleep. You

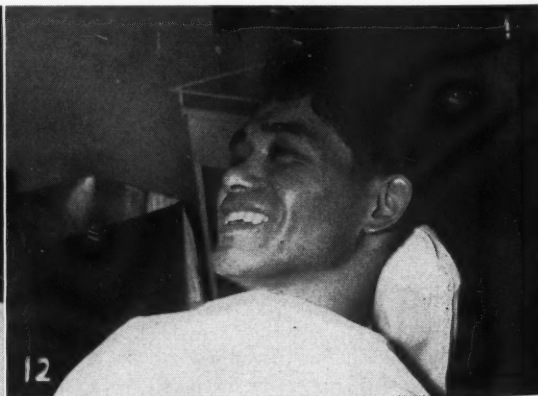
will keep your eyes closed until you are told to open them. Remember, you must imagine you will go into deep hypnotic sleep. You will be fully conscious of everything about you. You will hear everything that goes on, although you will not let any extraneous sounds or noises bother or disturb you. You will go deep asleep when I count to 10." He counts to ten. "You will close your eyes. You are now in deep hypnotic sleep. You will always hear me talking to you and you will pay close attention to what is said to you. You are going deeper and deeper to sleep."

(End of Part One)

436 Gate City Building



11.
Shows the patient awakening. The suggestions concerning freedom from pain and the control of salivary flow that were made during the hypnotic state have been removed. Any post-hypnotic suggestions that are necessary have been



made. The patient has been told that at command he will awaken completely relaxed.

12.
Patient awake.

A Precision Corrected WAX INDIRECT INLAY Impression Technique

LEON DELSON, D.D.S.,
Whitestone, New York

DIGEST

The procedure described in this article has been used by the author for more than 20 years with notable success. Wax that is satisfactory for direct impressions has been found in practice to be equally satisfactory for indirect techniques. Of the waxes tested for this purpose all brands of hard baseplate, or any inlay wax were equally responsive in use and provided accurate results. The method described, for which the step-by-step procedure is illustrated, is so exact that examination of the models will show under magnification all the scorings and markings left by burs and stones in the cavity preparation.

Advantages of the Technique

The introduction of hydrocolloids and rubber base materials has not caused the technique described here to become obsolete. On the contrary, the following advantages contribute to the exceptional value of the method:

- (1) Extreme accuracy of cavity detail duplication
- (2) The ability to obtain cervical and subgingival detail without tissue resection or special syringe equipment
- (3) Freedom from air bubbles
- (4) The ability to correct the defective impression

(5) The simplicity and availability of the materials required

Armamentarium Required — No special equipment is required. The most useful materials are the following:

- Alcohol
- Inlay wax in stick form
- Large spoon-shaped spatula
- Cotton pliers
- Crown shears
- Alcohol lamp

Steps in Technique—The illustrations provide a visual presentation of the successive steps taken in this procedure:

Figure 1—The essential materials required for completing the technique are shown, except the compound discs which can be cut from softened, high-heat modeling compound cake with a knife or an out size sewing thimble used in the same manner as a cookie cutter.

Figure 2—Select a loose, free-fitting copper band and trim to the gingival contours. Smooth roughed edges left by the shears. Anneal by heating to red heat and plunge into the denatured alcohol to cleanse and thorough-

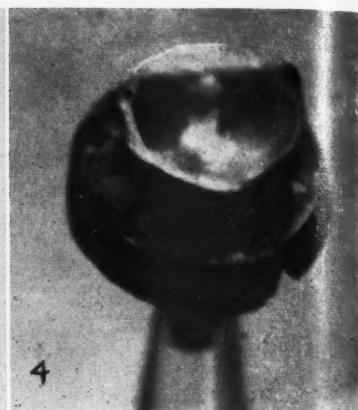
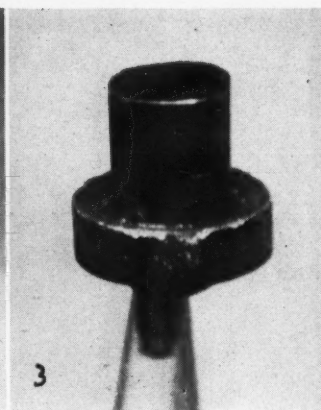
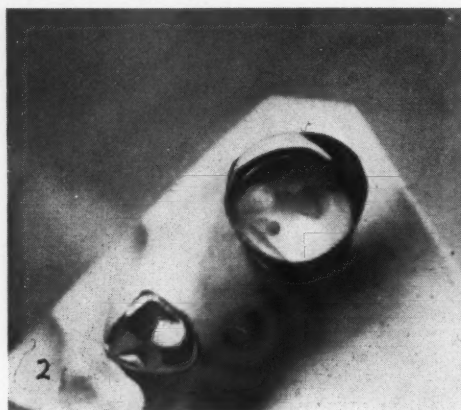
ly soften. This is an important step. Wax and modeling compound are thermoplastic substances, even at room temperature. Any spring or tension left in the metal will cause distortion of the final impression in an extremely short period of time.

Figure 3—Warm the band enough to permit the occlusal end to sink into the modeling compound disc. This disc will enable full pressure to be applied in placing the impression wax and also provides a means of removing the wax occlusally without side-ward pressure on the copper band and its contents.

Figure 4—Fill the band with molten wax. As it cools there will be a tendency for a funnel to appear as the shrinkage is toward the periphery. When cooled to a soft mushy consistency, press the impression completely into place and hold for approximately 15 seconds. Remove without cooling. Examine the impression to ascertain whether there are any drags due to undercuts in the preparation.

At this stage the impression will look good but will actually be highly





inaccurate as the wax is not chilled to full hardness. Chill under cold water to complete hardness. This is also an extremely important step, as at this point the maximum shrinkage of which the wax is capable is introduced with consequent distortion as wax is well known for its volumetric change with temperature variation. This distortion is to be compensated at the next step.

Figure 5—With a sharp lancet, carve away all flash, overflow, and any undercut areas formed by the bell of the tooth. Dry the impression with a blast of air and with the spoon spatula flow a layer of liquid wax over the entire cavity surface of the impression. Do not wait, but immediately place the impression in the cavity. The excess liquid wax will spurt out from the impression, leaving a

layer of wax that has welded to the original chilled impression. The liquid is driven by hydraulic pressure into every minute detail of the preparation, correcting all deficiencies. With a sickle scaler remove all extruded wax. After 20 seconds gently draw the impression from the cavity and examine. It is not necessary to chill the impression at this time, because there was only a thin layer of wax left on the basic impression and this was readily chilled by the previously chilled wax. It cools so rapidly that there is virtually no thermal shock.

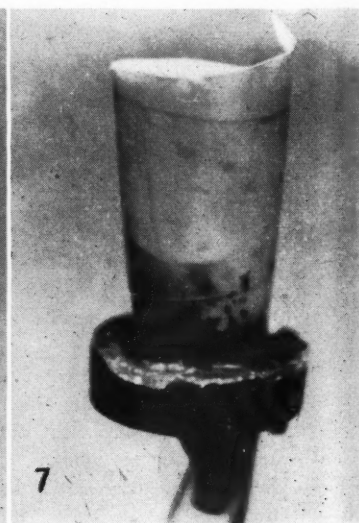
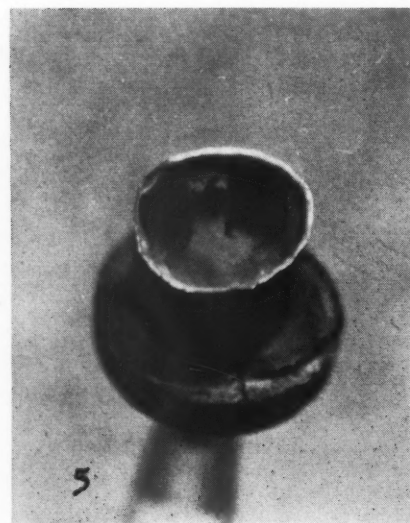
Figure 6—Dry the impression and if it is satisfactory, wrap a spiral of cellophane tape around it in such a manner as to create a tube.

Figure 7—Experience has shown that it is desirable to pour the impression as soon as possible in order

to avoid possible change due to long exposure to varying temperatures. Die stone has proved the most practical material. It is mixed to a putty consistency, gently vibrated into the impression and allowed to set fully.

Figure 8—The tape is stripped off the hardened model stump, and the wax impression washed away by a stream of boiling water to which a tablespoon of trisodium phosphate has been added. This flushing with a stream of water will permit the removal of the impression without the slightest destruction of accuracy of detail.

Set the die to one side and permit it to dry completely at room temperature. Then drop the die into a solution of liquid soap for one-half hour. Remove the die and lubricate it with a mixture of glycerine and liquid



soap, equal parts, before waxing up the inlay pattern. Carving should be done with dull, warm burnishers and carvers in order to avoid cutting any of the stone model.

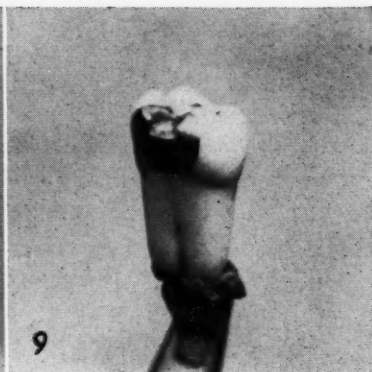
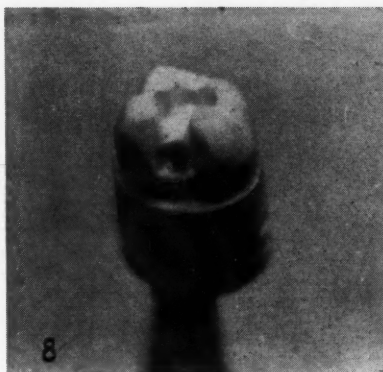
Figure 9—The gold inlay is shown finished, polished, and in position in the prepared cavity.

Final Measures

The wax impressions can be copper plated, silver plated, packed with amalgam or die stone. Die stone has been found to be the quickest and is sufficiently hard for any normal handling.

Pitledge Impressions—The pits should be filled before Step 5 is completed with a sticky wax to which 25 per cent of beeswax has been added. If coloring is desired a small piece of blue inlay wax will give it the desired tint. This combination of sticky wax and beeswax is extremely useful for pit ledges and for partial corrections before the final correction (Fig. 5) is done.

Pinledge Impressions—Use plastic or metal pins in the anchor holes. The wax driven into these minute preparations is too fragile and easily broken. The use of Cristobalite dies for pinledges is an excellent way of preparing the wax pattern. Cristobalite is mixed on a glass slab with a little



water to a heavy putty consistency. It will flow under vibration readily. When fully hardened the wax may be scalded off. This Cristobalite model is as hard as plaster and if permitted to dry before dipping into melted paraffin will stand the usual waxing process with no loss of detail. It creates a most excellent fit and does not permit any problem in the picking-up of platino-iridium pins.

Three-Quarter Crowns—Cut a V-shaped notch out of the cervico-facial aspect of the copper band to prevent locking the impression by a cervical undercut. A thin film of cocoa butter swabbed into the cavity is an excellent means of lubrication and is readily removed from the wax by the application of alcohol or liquid soap.

Full Gold Cast Crowns—For porcelain or acrylic jackets and full gold cast crowns this technique is recommended for accuracy and ease of manipulation. Neither mastering of complicated procedures nor special equipment is required to obtain an accurate duplication of a cavity preparation. If at any time there is a failure in the finished result and the completed casting will not fit into the tooth cavity after demonstrating excellent fit to the die, it will invariably be found that some error was committed in the steps previous to that shown in Figure 8. Operators who have mastered this technique have discarded all others in favor of it.

19-02 Utopia Parkway

Chelating Substances in Medicine

ROBERT B. ABINGTON, CAPTAIN (MC) USA

Description of Reaction

Chelating agents possess the unique ability to combine with or "entrap" a metallic ion and inactivate it. The metallic ion reacts with the two ends of a short chained substance, thus creating a ring structure with the metallic ion tightly bound within the ring. In reality the structural mechanism is more complex, but the metallic ion always is bound within the molecular structure of the chelate from at least two sides. With the surrounding and binding down of the metallic ion, it is inactivated and isolated

from further chemical reactions. This stable, readily soluble, metal complex then is easily removed from the body by normal renal function.

Effects on Metabolism—The theoretic implications of chelates and their effect on body metabolism are almost limitless. Any enzyme reaction utilizing a trace metal could be potentiated or inhibited by appropriate chelates, depending on the degree of attraction for the specific metal that is necessary for the enzyme reaction.

Many Drugs Chelating Agents—

The list includes many of the antibiotics and the present-day anti-tuberculosis drugs. The role that chelation plays in influencing the effectiveness of these drugs is inadequately understood. A practical point concerning antibiotics is the chelation of aluminum and magnesium by the tetracyclines. The metal-salt combination prevents absorption of the antibiotic from the gastrointestinal tract. The use of antacids containing aluminum or magnesium along with the tetracyclines therefore is considered unwise.

Adapted from *United States Armed Forces Medical Journal* 9:987 (July) 1958.

Severe PROTRUSION of the MANDIBLE:

Surgical Correction

JOHN B. ERICH, D.D.S., M.D.*

Rochester, Minnesota

DIGEST

Mandibular prognathism develops in some persons to such a degree that surgical correction is advisable not only to restore normal facial contours but also to establish proper function of the jaws. There should be no hesitancy in recommending surgical treatment for severe protrusion of the lower jaw, because present-day techniques allow this deformity to be corrected safely and effectively (Fig. 1). Although many surgical procedures have been devised to correct mandibular prognathism, none of them is completely without fault; each possesses advantages and some disadvantages. This article describes the technique successfully adopted by the author.

Simple and Effective

Operations for mandibular prognathism may be divided into two categories, namely those performed on the rami and those on the body of the mandible.

Bilateral resection of a segment of bone from the body of the mandible with preservation of the inferior alveolar nerve and artery has proved to be the simplest and most uniformly effective means of correcting mandibular prognathism.

General Description—This technique divides the lower jaw into three fragments. When the anterior frag-

ment is forced backward to approximate the two posterior segments, the deformity is corrected. Bilateral osteotomy of the body of the mandible never disturbs the temporomandibular joints or muscle attachments to the rami and never produces an open bite or any degree of fibrous ankylosis, complications that sometimes occur with some of the operations on the rami.

Disadvantages—The only real disadvantage to bilateral osteotomy performed on the body of the mandible is the necessary shortening of the lower dental arch, and this appears to be of minor importance in view of the fact that the patient is able to incise and masticate food properly.

Surgical Technique

In 1941, a technique¹ was described for removing a segment of bone from each side of the body of the mandible without injuring the inferior alveolar nerve. In 1948, Dingman² changed this operation into a two-stage procedure. In recent years, the author has found it advantageous to divide the method still further into three stages.

Local Anesthesia Used—All three stages of the operation are done with the patient under local anesthesia, which consists of block anesthesia of the inferior alveolar nerves together with local infiltration of piperocaine (metycaine) hydrochloride at the operative site. The separation of this operation into three stages has much merit, because the wound in each submaxillary region through which the osteotomy is performed does not communicate with the mouth.

Postoperative Discomfort Lessened—Resection of the segments of bone in two stages, that is, one side at a time, with the aid of local anesthesia, apparently lessens the postoperative swelling and discomfort and permits immediate intraoral immobilization of the fragments at the end of the third stage. Patients on whom this three-stage operation has been performed have had remarkably little postoperative discomfort. Moreover, this technique transforms a single prolonged and laborious procedure into three short and simple techniques.

Preliminary Measure—Before the first stage of the operation is undertaken, good impressions of the upper and lower dental arches must be secured. From these impressions, plaster models can be prepared for study. Only from such plaster models can be determined the exact size and location of the segments of bone to be removed. Preoperative roentgenograms, particularly lateral views, also should be secured; from these roentgenograms can be observed the precise position of the mandibular canal in relation to the vertical dimensions of the body of the mandible.

First Stage—As outlined by Dingman², the first stage involves the extraction of all teeth in the two portions of bone that eventually are to be removed. In addition, a dental bur or a motor-driven circular saw is employed to make two parallel cuts

*Section of Plastic Surgery, The Mayo Clinic.
¹New, G. B., and Erich, J. B.: Surgical Correction of Mandibular Prognathism, *Am. J. Surg.* 53:2-12 (July) 1941.
²Dingman, R. C.: Surgical Correction of Developmental Deformities of Mandible, *Plast. & Reconstruct. Surg.* 3:124-146 (March) 1948.



on each side of the mandible from the alveolar process down close to the mandibular canal (Fig. 2A). The bone between these cuts corresponds in width to the segment of bone to be resected. However, the bone intervening between these cuts is not removed during the first stage; otherwise, scar tissue would form in the resultant spaces and, in turn, would prevent proper approximation of the bony segments during the later stages of the operation. When the intraoral wounds made by the extraction of teeth and the saw cuts have healed, which usually is a matter of 3 or 4 weeks, the second stage is undertaken.

Appliances for Immobilization— Before the second stage of the operation is begun, intraoral appliances must be inserted and attached to the teeth for ultimate fixation of the bony fragments. Much of the success of any operation for the correction

of mandibular protrusion depends on the effectiveness of the appliances used for immobilization. Hooked arch bars with intermaxillary elastic bands provide the ideal method of immobilization (Fig. 2B).

Method of Attachment: (1) A hooked arch bar is ligated to the teeth of the upper dental arch.

(2) A small piece of a hooked arch bar is then ligated by wires to the teeth that will remain in the lower anterior fragment.

(3) If a molar tooth will remain intact in either posterior fragment or both of them, an orthodontic anchor clamp band may be applied to such a tooth.

1.
Two patients who had severe mandibular protrusion corrected by bilateral osteotomy of the body of the mandible. The preoperative views are on the left and postoperative views on the right. A nasal plastic operation also was performed on the first patient to correct a nasal deformity.

Secure Attachment Provided: Such a band, when properly clamped over the tooth, cannot be displaced, is much more secure than a wire passed around a tooth, and provides excellent attachment for intermaxillary rubber bands.

Second Stage—(1) After all the intraoral appliances are in position, the second stage of the operation can be undertaken.

(2) Although general anesthesia can be employed if it appears desirable, local anesthesia is used in most cases, as already indicated.

(3) An incision 4 to 5 centimeters in length is made in the submaxillary region about 2 centimeters below the lower border of the mandible in order not to injure the marginal mandibular branch of the facial nerve. Through this incision, the body of the mandible is exposed by blunt dissection.

(4) By the use of periosteal elevators, the periosteum is reflected away from the buccal and lingual surfaces and the upper edge of the bone to expose the full circumference of the lower jaw where the segment of bone is to be removed.

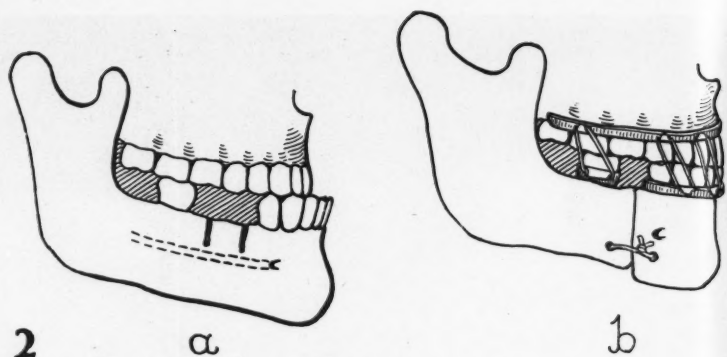
(5) After reflection of the periosteum, the saw cuts previously made through the alveolar process are readily visible.

(6) The entire wound should not communicate with the oral cavity. However, if a small tear is made in the overlying mucous membrane, no harm is done.

Resection Technique — (1) By means of an indelible pencil, two parallel lines are drawn on the external surface of the mandible to connect with the saw cuts. The distance between these two lines represents the width of the segment of bone to be resected.

(2) A motor-driven circular saw is employed to cut along each of these pencil lines from the lower border of the mandible upward almost to the level of the mandibular canal (Fig. 3A). This saw should be used with caution and kept at a safe distance below the inferior nerve.

(3) A chisel is placed between the upper extremities of these two lower



2A.

First stage of bilateral ostectomy for correction of mandibular prognathism. Teeth in each segment of bone to be removed are extracted and two cuts have been made with a motor-driven circular saw from the alveolar border down toward the mandibular canal.

2B.

Second and third stages of bilateral ostectomy have been performed. Appliances for dental fixation are in place. Segments of mandible have been removed. The fragments are held together with heavy chromic catgut if teeth are present in the lower fragments for fixation. If no tooth is present in the posterior fragment, tantalum wire rather than catgut holds the fragments in apposition.

saw cuts (lower part of the mandible) and, by firmly tapping it with a mallet, the intervening portion of bone is removed (Fig. 3B).

(4) The chisel is then placed between the upper saw cuts (made one month previously) in the jaw, and the piece of bone between these two saw cuts is detached.

(5) After these two pieces of bone are removed, only a small amount of bone remains about the nerve and vessels. By careful use of small rongeurs (Fig. 3C), this remnant of bone is gradually nibbled away and the nerve and blood vessels which are left intact, are exposed (Fig. 3D).

(6) A curet is used to remove some of the cancellous bone surrounding the nerve and vessels in each segment. A cavity is thus created in which the exposed nerve and vessels can rest without injury when the anterior and posterior segments are brought into apposition.

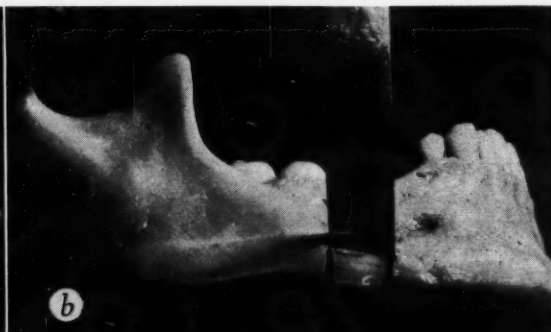
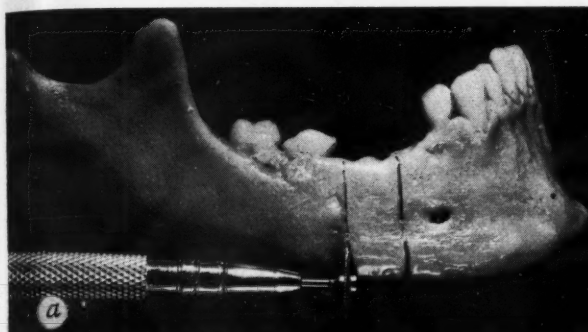
Fragments Joined—(1) A small hole is drilled in each fragment near the lower border of the mandible about 1 centimeter from the cut edge. If a tooth is present in the posterior fragment for fixation, it is advisable

to place heavy chromic catgut through these two holes to approximate and hold the fragments together. However, if there is no teeth, a piece of heavy tantalum wire can be used for this purpose (Fig. 3E). When the anterior and posterior fragments can be immobilized by interdental fixation, the bony fragments should be held together only with catgut, which gradually is absorbed. Occasionally, a wire used for this purpose causes trouble and requires removal months or years later.

(2) After the two fragments of bone have been tied together either with catgut or wire, the soft tissues overlying the bone are brought together and the incision in the skin is carefully sutured. In most instances, drainage is not necessary, and the patient experiences comparatively little postoperative pain and discomfort.

Third Stage—The third stage of the operation is performed 2 or 3 days later. This involves removal of the segment of bone on the opposite side of the mandible, and the technique is identical to that described.

Rubber Bands Applied—As soon



3.
Removal of segment of bone without injuring inferior alveolar nerve in mandibular prognathism.

3A.
Teeth in segment of bone to be removed were extracted one month before. Saw cuts were made previously with a motor-driven circular saw from the alveolar edge down near to the mandibular canal. Circular saw now makes two cuts from the lower border of the jaw up close to the mandibular canal.

3B.
Chisel removes intervening bone.

3C.
Chisel has removed bone between upper cuts. Careful use of rongeurs removes remaining bone around inferior alveolar nerve.

3D.
Segment of bone completely removed without injuring nerve.

3E.
Anterior fragment is moved back into apposition with posterior segment. Fragments are held together with catgut or tantalum wire.

as this stage is completed, the elastic bands can be attached to the teeth (Fig. 2B). By constant traction, these rubber bands tend to pull the lower teeth into satisfactory occlusion with the upper dental arch. These rubber bands can be left in place for 4 to 5 weeks for immobilization of the fragments of the lower jaw.

Occlusion May be Improved—The three fragments of the mandible usu-

ally heal satisfactorily in 5 weeks, after which the fixation appliances are no longer necessary. After removal of all intraoral devices, the dental occlusion often can be greatly improved by grinding down cusps of teeth that interfere with good articulation.

Summary

A three-stage operation, all stages

of which can be performed with the patient under local anesthesia, has been described for the surgical correction of mandibular prognathism. This technique possesses advantages over previous procedures that have been recommended for this deformity.

Adapted from *Proceedings of the Staff Meeting of the Mayo Clinic* 33:331-336 (June 11) 1958.

An Evaluation of 2400 Cases

Using POLYSTYRENE Dental Base Material

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DIGEST

The author of this article has had extensive experience in the use of polystyrene in denture construction in his practice. In a period of 211 weeks more than 2400 dentures were made employing this material. Remarkably good clinical results were obtained. A detailed report is presented of the series of 2400 cases including a description of the material and a discussion of the advantages derived from its use.

Objective in Denture Construction

Ford¹ has stated: "The dentist's goal should be to produce stable, comfortable, efficient, esthetically acceptable dentures for his patients, and these conditions should be maintained over a reasonably extended period of time. . . . In accepting the patient, regardless of the fee, the dentist has taken on the obligation of maintaining (1) the health of the tissues, and (2) the harmonious function of the masticatory organ."

Polystyrene Employed—In agreement with Ford's definition of the goal in denture construction, the author has for some years used routinely in a practice which is 60 per cent prosthetic, polystyrene, a base material with physical properties superior to acrylic in many ways.

Clinical Results Good—In 211 weeks with a weekly average of 11.37 cases in which this material was specified more than 2400 cases were processed in polystyrene with remarkably good clinical results.

No Acrylic Present—To the author's knowledge polystyrene is the only denture base resin that is prepared before molding, completely nontoxic, and which contains no acrylic monomer, or acrylic of any sort.

Deficiencies of Acrylic Materials

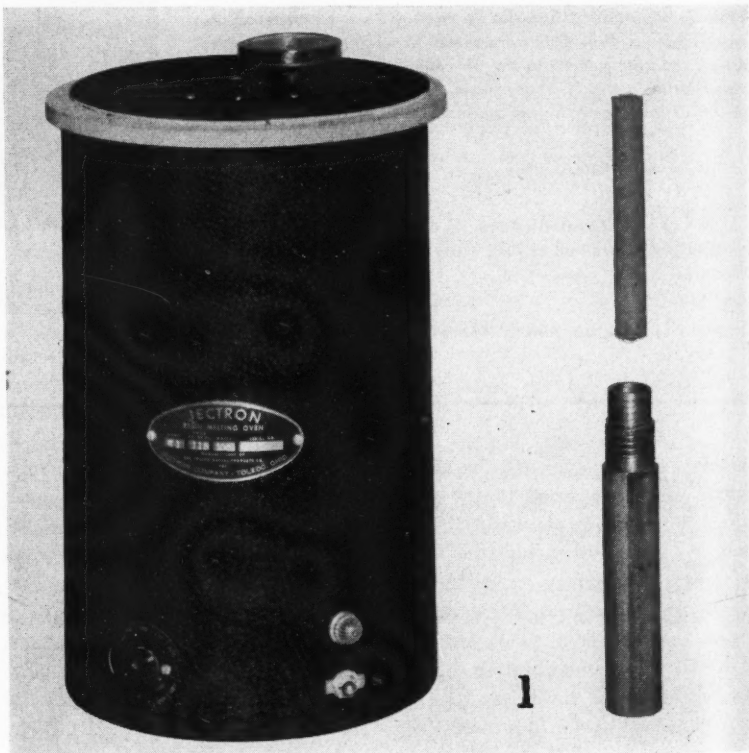
Recent reports in dental literature^{2,3} have called attention to various deficiencies of acrylic denture base materials. These include the following deficiencies:

- (1) Excessive dimensional change

¹Ford, Wayne B.: A Technic and Occlusal Form Designed to Produce Stability in Dentures, JADA 54:212 (Feb.) 1957.

²Slack, Fred A.: Experiments in Directional Polymerization, DENTAL DIGEST 63:356 (Aug.) 1957.

³Lammie, G.A.: The Retention of Complete Dentures, JADA 55:502 (Oct.) 1957.



1. Polystyrene resin (top) is inserted into injection tube (below). Tube is then placed in electric oven (left) where resin is softened for molding, and melts before it is injected into the mold.

(2) Danger of reaction to acrylic monomer

(3) Imprecise molding techniques

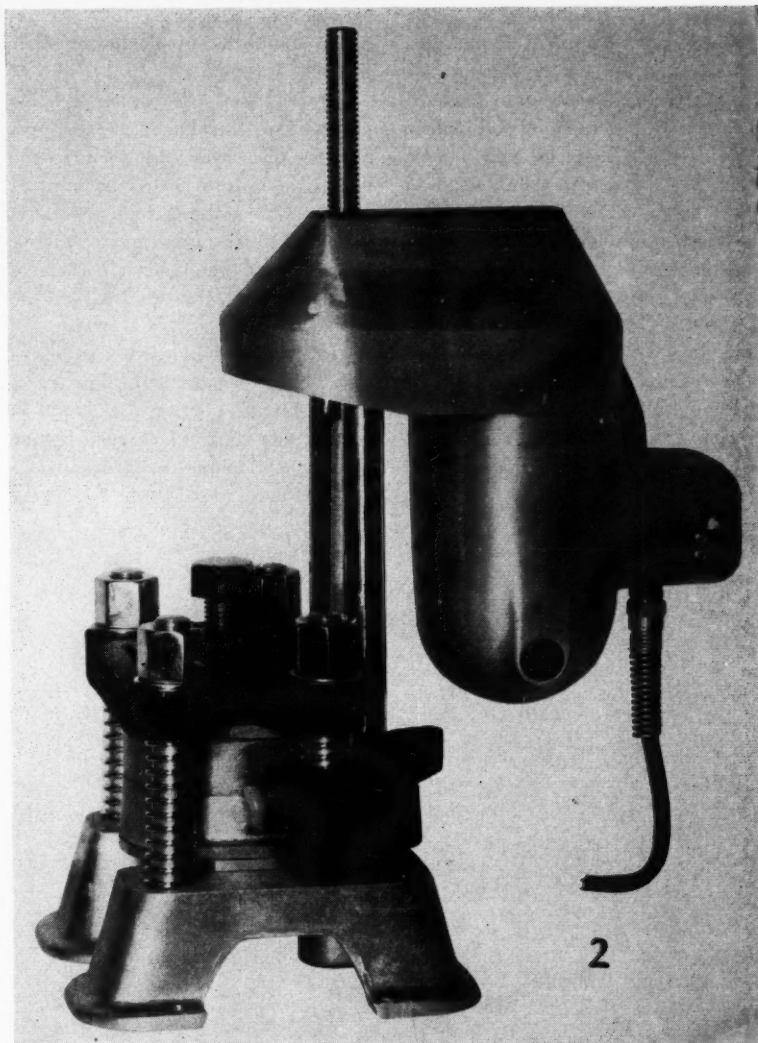
(4) Instability of form in use

Dimensional Change in Acrylic Dentures—Because acrylic dentures must be cured *after* molding to effect polymerization of the monomer that is used as a plasticizer they undergo contraction amounting to 5 to 7 per cent of their total volume, depending upon the powder-liquid ratio.^{4,5} Attempts have been made to correct this condition by injecting additional material during the curing process.

Reaction to Acrylic Monomer—There are many references in dental literature to the dangers of sensitization to acrylic monomer.^{6,7,8,9,10,11} Self-curing acrylic dentures in particular are apt to contain quantities of unpolymerized plasticizer.

Imprecise Molding Techniques—No really precise, reproducible technique has ever been developed to process acrylic dentures although several attempts at such a technique have been described. Dentists discover continually that even an excellent technician may err in processing an acrylic denture, with results that include (1) opening of the bite, (2) warpage, and (3) incomplete polymerization.

Instability of Acrylic Dentures—Largely because they often fail to approximate the dimensions of the model and consequently the dimensions of the patient's mouth, acrylic dentures are notoriously subject to changes of form during use. Tests conducted on acrylic dentures by means of (1) increasing temperature, (2) immersing in solvents, or (3) use of polarized light all showed that acrylic dentures are definitely sub-



2. Flask is assembled, injection tube is attached, both are locked in position on transinjection machine, which is actually a miniature of industrial precision-transfer machines. Transinjection machine ram injects heat-softened polystyrene resin in flask (above). Molding is complete when resin emerges through exit sprue in side of flask.

ject to internal strain.¹² Most dentists know this and consider it unavoidable. The "amazing ability of the tissues of the mouth to adapt" is relied upon to secure final satisfactory results.

Source of Dissatisfaction—Without doubt, the instability of acrylic dentures causes much patient discomfort and creates a high percentage of the chronically dissatisfied cases which

many dentists describe as neurotic.

Physical Properties of Polystyrene^{13,14}

The physical properties of polystyrene and the method of processing polystyrene dentures indicate why polystyrene is much more desirable than acrylic as a denture material.

Description—The polystyrene material from which the 2400 dentures

⁴Tylman, Stanley D., and Peyton, Floyd A.: *Acrylics and Other Denture Resins*, Philadelphia, J. B. Lippincott Company, 1946, p. 125.

⁵Osborne, John: *Acrylic Resins in Dentistry*, ed. 3, Springfield, Illinois Charles C Thomas Publisher, 1948, p. 22.

⁶Fisher, Alexander A.: Allergic Sensitization of the Skin and Oral Mucosa to Acrylic Resin Denture Materials, *J. Pros. D.* 6:593 (Sept.) 1956.

⁷Stoy, P. J.: Denture Sore Mouth with Particular Reference to Acrylics, *J. Irish D. A.* 7:13 (Mar.-April) 1952.

⁸Moody, W. L.: Severe Reaction from Acrylic Liquid, *DENTAL DIGEST*, 47:305 (July) 1941.

⁹Hollander, L., and Kennedy, R. M.: Dermatitis Caused by Autopolymerizing Acrylic Restoration Material, *DENTAL DIGEST* 57:213 (May) 1951.

¹⁰Nyquist, G.: Study of Denture Sore Mouth. An Investigation of Traumatic, Allergic and Toxic Lesions of the Oral Mucosa Arising from the Use of Full Dentures, *Acta Odont. Scandinav.* 10:supplement 9, 11-154.

¹¹Bradford, E. W.: Case of Allergy to Methyl Methacrylate, *Br. D. J.* 84:195 (May 7) 1948.

¹²Osborne, John: *Acrylic Resins in Dentistry*, ed. 3, Springfield, Illinois, Charles C Thomas Publisher, 1948, pp.32-33.

¹³Anon.: Putting the Bite on Styrene, *Modern Plastics*, 33 (Sept.) 1955.

¹⁴Anon.: A New Plastics Family Possessing Unique Characteristics, *Dow Diamond*, 20:20 (Feb.) 1957.

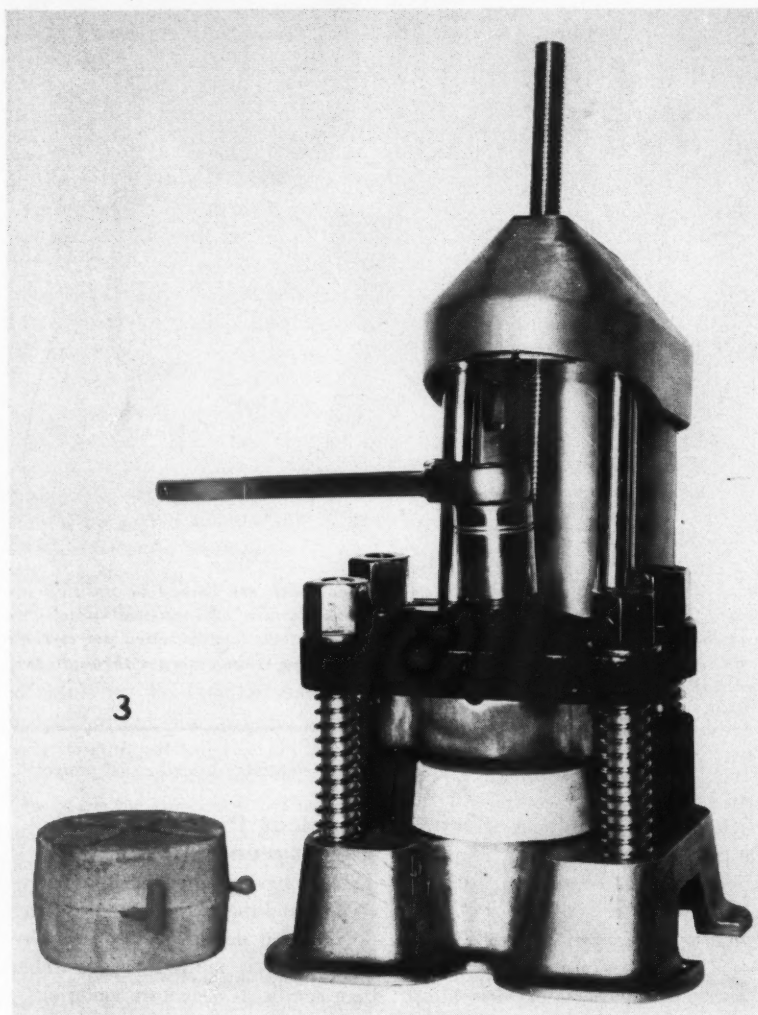
in this series were molded is a complex, specially modified combination of styrenes, precured during the manufacturing process into bars approximately 6 inches long and $\frac{3}{4}$ inch in diameter. Dentures are molded from this material in a unique injection machine which is a miniature of the precision molding apparatus used in industry.

Special Recommendations — The fact that it contains no acrylic monomer, or acrylic of any kind, cannot be overemphasized. By contrast, the styrenes of which the polystyrene is composed are notably (1) nontoxic, (2) nonsensitizing, (3) not subject

to water swelling, and (4) are completely unaffected by alcohol or other common solvents.

Comparative Advantages — While processing, shrinkage of dentures made with acrylic monomer as the plasticizer is from 5 to 7 per cent of volume. Processing shrinkage of polystyrene dentures, however, is only $\frac{3}{4}$ of 1 per cent. The material compares favorably with other materials in the following respects:

- (1) For hardness and smoothness
- (2) For an extremely high transverse strength (14,000 p.s.i.).
- (3) It is about 14 per cent lighter than acrylic denture materials.



3.

RIGHT: Transinjection machine contains an inbuilt Ejector to remove investment from flask. Note investment ejected from one-half of flask. **LEFT:** When ejected, investment appears as a solid body, proving the absence of flash, or opened bite.

Technical Considerations Favorable

Injection Molding Process—Polystyrene dentures are molded or “packed” using a specially designed injection machine. The entire denture is formed in a single, precise 12-second operation. There is no margin for technician error.

Possibility of Flash Eliminated—In the technique a bar of fully cured polystyrene is softened by heat. It is then injected into a closed flask which is locked against opening. This eliminates the presence of the common “flash” and possible injury to the accuracy of the occlusion. Upon cooling, the polystyrene hardens to its normal state when the flask may be opened and the denture removed for polishing.

Form Stability of Polystyrene Dentures—Results from clinical trials in early cases were so favorable that polystyrene is now used routinely by the author for almost all denture patients. At present in this practice about 500 cases per year are fitted with polystyrene dentures.

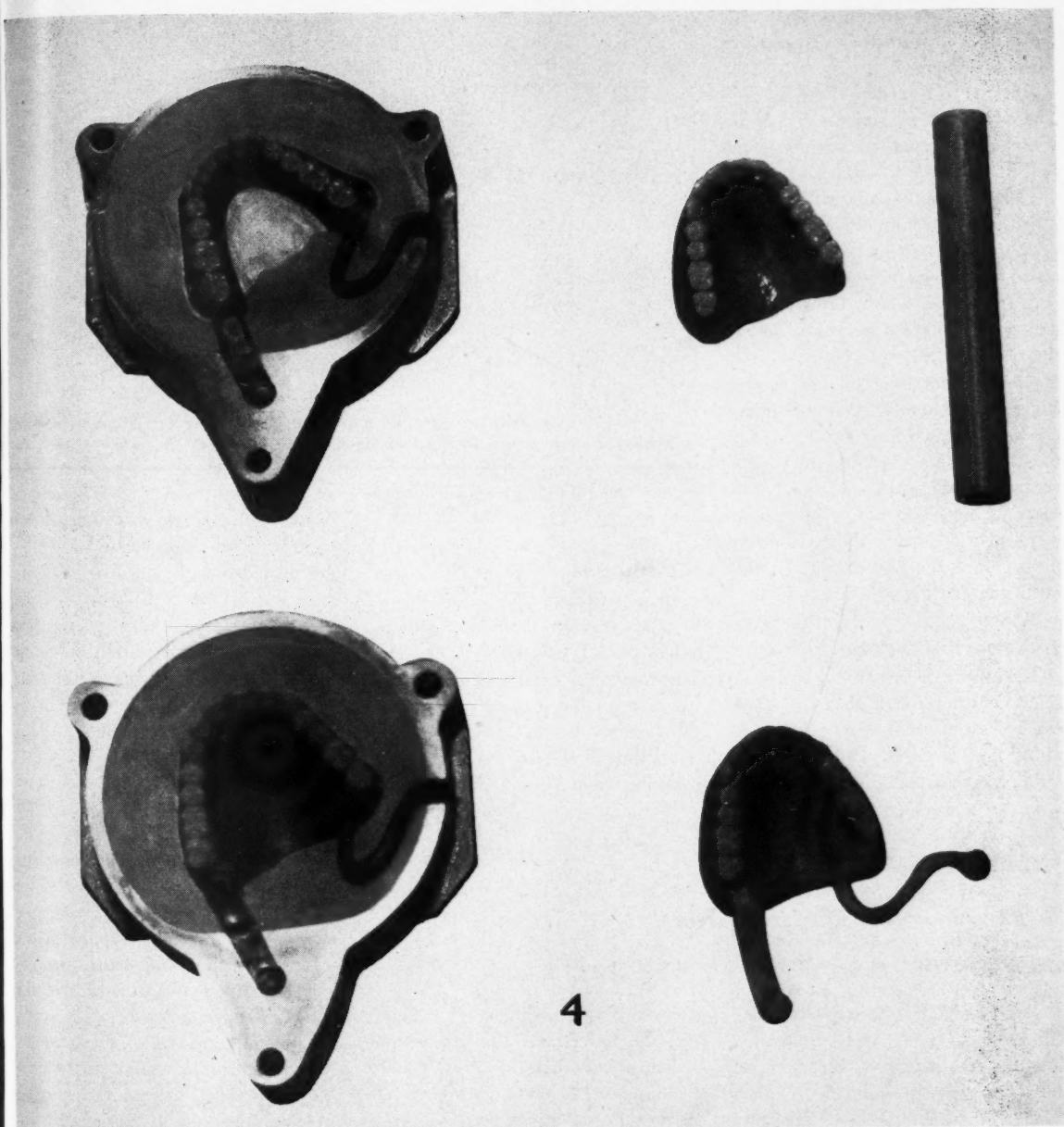
Original Fit Satisfactory—One important observation from extensive clinical experience is the form stability of the dentures. Reviewing the records of these 2400 cases, almost universal patient satisfaction with the original fit of the appliance is noted in contrast to the long “breaking-in” period required of many wearers of acrylic dentures.

Low Percentage of Rebase Operations—Even more significant than early satisfaction is the extremely low rate of patients (in normal good health) returning for rebase or relining operations. These amount to a total of only 1 per cent of the cases, not including immediate denture cases.

Continued Wear Satisfactory—Innumerable reports have been received from patients who have had continued satisfaction with polystyrene dentures used for 4 to 5 years. Most of these reports have come from new cases referred by satisfied patients.

Tissue Compatibility of Polystyrene Dentures

Reference has been made to the danger of sensitization to acrylic



4. **LEFT:** Lower-halves of invested cases before boil-out. Polystyrene is injected into mold through inlet-sprue attached

to one heel (bottom left in photo). When mold is completely filled, surplus polystyrene resin escapes through exit-sprue at right, which signals op-

erator to shut off injection pressure. **RIGHT:** Completed moldings removed from the investment with sprues attached, ready for finishing.

monomer. Some authorities believe this to be the principal cause of "denture sore mouth." It is certain that many acrylic dentures, especially those processed by self-curing, contain more than enough unpolymerized acrylic monomer to cause eczematous reactions on both skin and oral mucosa.

Improper Fit may be Cause—Cases have also been described where the typical chronic inflammation appears to have been caused by a nonspecific pressure effect.¹⁵ In other words, the dentures *did not fit properly*.

An Important Aspect in Tissue

¹⁵Boos, Ralph H.: Physiologic Denture Technique, J. Michigan D. A. **38**:315 (Nov.) 1956.

Health—It is believed that tissue compatibility is an important and too often neglected aspect of any prosthetic practice. More than 100 cases per year are seen in this office where the patient suffers from so-called "denture sore mouth." Almost all of these cases have been referred by previous patients. It is a gross understatement

to say that they are dissatisfied with the acrylic denture they are wearing when first seen.

Effective Regime Prescribed—

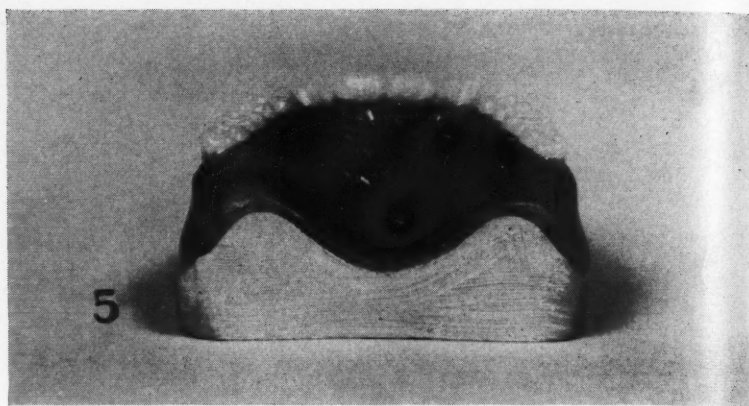
These dissatisfied patients have universally responded to a simple regime that involved the following measures:

1. Reduction of inflammation with 1 per cent adrenalin chloride
2. Replacement of the acrylic denture with a polystyrene denture
3. Use of the old dentures only for eating for 2 or 3 days before taking the final impression

Relief Obtained—On the routine suggested not one of several hundred cases has redeveloped any symptoms of chronic inflammation. This clinical record may be attributed to (1) absence of the allergenic acrylic monomer, and (2) form stability in use of the denture that precludes development of irritating pressure points.

Impression Technique

The impression technique used routinely in this entire series of 2400 cases is a standard, widely used technique that, in itself, cannot account for the excellent clinical results uni-



5. *Fit of polystyrene denture after 14 months of mouth service. Denture retains original form, as shown by conformity to stone model.*

formly seen with these polystyrene dentures.

Summary

In a period of 211 weeks the author has provided more than 2400 patients with polystyrene dentures. These dentures have proved outstanding in providing patient comfort and satisfaction. Hundreds of these patients were first seen when they were suffering from chronic inflammation

as a result of wearing acrylic dentures. Not a single case has shown recurrence of the condition after being provided with a new polystyrene denture.

Routinely specifying polystyrene for processing cases has resulted in substantial savings of chair time per patient, and a high percentage of referrals by satisfied patients.

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Stress and Disease:

A Review of Principles

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A Biologic View of Illness

The biologic view may be contrasted with the mechanistic. According to the latter view, the human organism is a machine composed of mutually adjusted parts working together. Illness results from a breakdown in the machine, and the cause of illness must lie in a fault, disease, or imbalance in one or more of the parts. A list of the causes of illness is thus a list of faulty parts or local lesions. The physician's task, in this view, is to discover and remedy the fault, and the more he knows about mechanism the more effective he will be.

The mechanistic view has in its time provided the framework for most of our present knowledge of the physics and chemistry of the body; and for understanding the processes

of certain sorts of illness—for example, the infections. Its conceptual structure does not, however, enable the observer to comprehend in full the meaning of events occurring in a disorder such as recurrent vomiting in children associated with a rage reaction. Here there is no bodily fault or lesion; the machine is working well enough, but the person is in trouble.

On the biologic view, illness can occur when the subject, predisposed to react in certain ways by his life experiences, encounters a situation to which he cannot readily adapt. The situation itself may not be especially dangerous or stimulating, but if the subject sees it as such and cannot take appropriate action stress is aroused in him; the form of mental and bodily response which he then shows will be

determined by his physical constitution, his personality pattern, and the nature of the situation.

Stress responses, then, appear in the organism when circumstances urge to action, but no action is taken. The discharge of anger in words or behavior, the working-through of grief by an explicit mourning, seeking of an appropriate outlet in states of sexual tension, reduction of anxiety by internal or external changes—these are examples of “resolution by action.” When the source of stress is outside conscious awareness (as it so often is) or when action is blocked by inner censorship or outward restraints, there follows disharmony in the organism which may issue in symptoms of illness. There seems to be some variation from one person to another, and from one culture to another, regarding the degree of tolerance of this disharmony; this may perhaps be explained by differences in experience.

Adapted from *British Medical Journal* No. 5091:285 (Aug. 2) 1958.

The FLAT RIDGE

and LOWER DENTURE Retention

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Clayton, Missouri

DIGEST

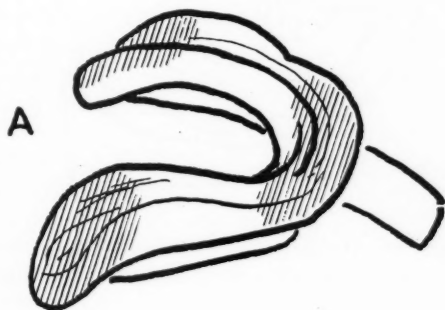
The problem of stability of the complete lower denture has been widely discussed in dental literature. Many procedures have been suggested and yet movement continues to be present on the flat ridges which are frequently encountered. Such mobility injures the already traumatized ridges, is a detriment to the patient's comfort, health, and self-esteem, and to the reputation

of the dentist who constructed the denture. This article presents a pictorial review of the most commonly made errors and their corrections. If the problem to be coped with is mechanical, the procedures illustrated will provide the stability possible within the limits of the tissues which support the denture. The result will be satisfactory and retention adequate, even on the flattest ridges.

Figure One

Any preferred impression technique may be employed. When the impression is ready for the corrective wash it should be tested for anterior-posterior rocking by pressing gently on the retromolar areas. If the impression comes up and away from the ridge in the incisor region, fill it in with stick compound in the retromolar and incisor areas until stabilized (A).

Take the final wash corrective impression. If this step is omitted the finished denture will teeter back and forth on the middle part of the ridge, causing much undue pressure and pain (B).

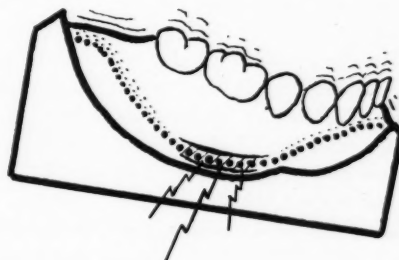


Technique Illustrated

The procedure in this technique is the same for the construction of a denture on a flat lower ridge as it is for the adequate ridge. If the denture is to be successful, however, measures as shown in the following illustrations must be taken and certain errors avoided.

1

B



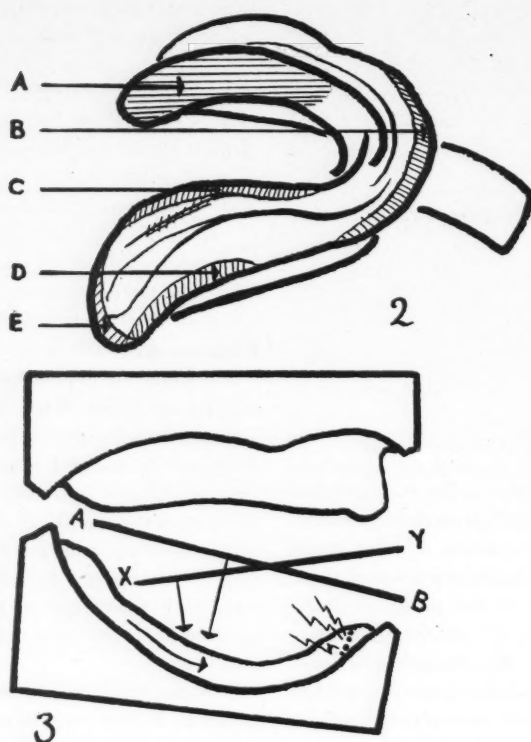


Figure Two

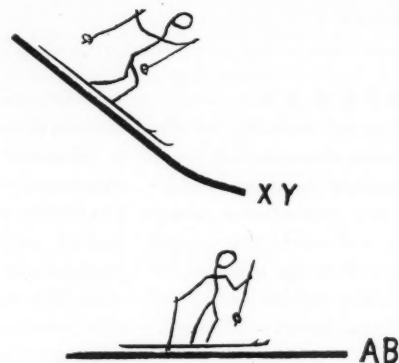
(A) Lingual flanges may be slightly thicker in the impression than they are intended to be after the denture has been worn and refined. This will permit adequate adjustment over the mylohyoid ridge.

(B) The labial flange should be carefully muscle trimmed. Otherwise the slightest tip movements will dislodge the denture.

(C) The entire extent of the lingual flange should be carefully muscle trimmed. Otherwise the slightest tongue movement will dislodge the denture.

(D) Overextension or excessive thickness of the denture border over the external oblique ridge at the attachment of the masseter muscle will cause the denture to bury itself in the soft tissue, producing cuts, abrasions, edema, pain, and gross instability of the denture.

(E) The impression should be slightly overextended in the retro-molar area. The denture must be adjusted to the exact line of attachments of ligaments and muscles when it is finished and refined. This step must be carried out with great precision and exactness.



it may migrate forward on the ridge into an edge-to-edge or even protrusive relationship with the upper denture.

Figure Four

After the dentures have been milled, they should be spot ground so that the teeth over the lowest part of the ridge occlude most heavily (A). Second molars should occlude *very* lightly (B). The incisors should *not* be in occlusion except in protrusive bite.

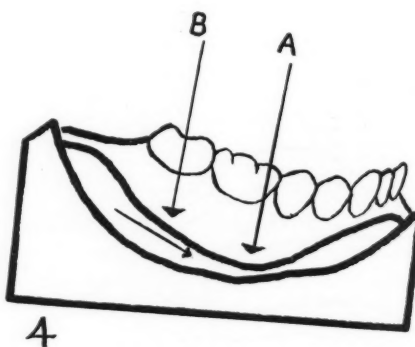


Figure Three

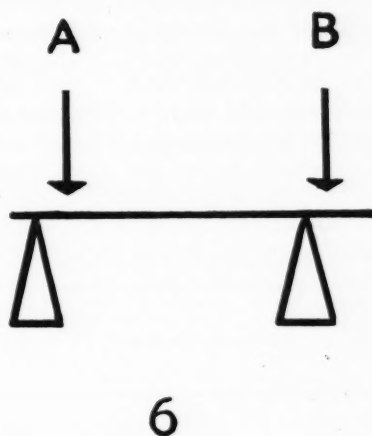
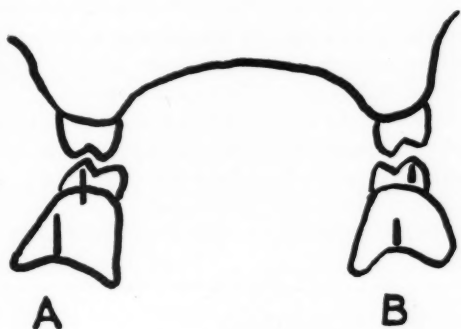
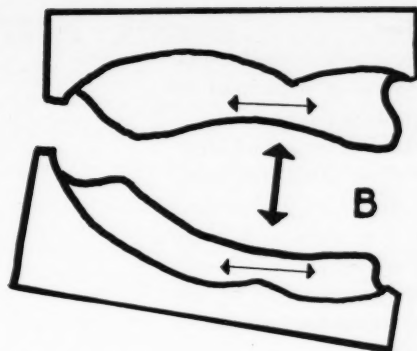
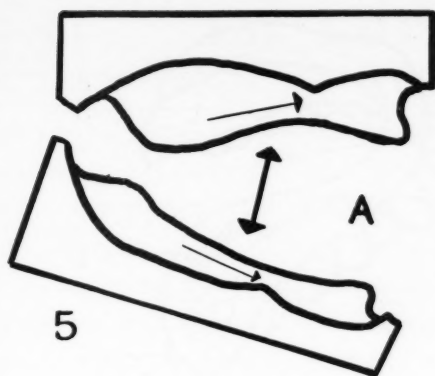
The teeth should be placed to approximate occlusal plane A-B so that the forces of mastication in the molar and bicuspid regions will seat the denture more firmly. If the teeth are set in an occlusal plane similar to X-Y, occlusal force in the molar region causes the denture to slide downward and forward, traumatizing the ridge, especially in the incisor region. With repeated adjustments to the lingual portion of the anterior part of the denture,

Figure Five

When upper and lower ridges diverge anteriorly, they force the denture out like a pinched watermelon seed (A). This condition renders denture retention impossible. The only measure possible is to reduce the vertical dimension until upper and lower ridges are parallel (B).

Figure Six

The mechanical principle of leverage, taught in high school physics, still



applies. Yet lower dentures are still constructed with bicusps and molars set outside the ridge so that occlusal forces tip and dislodge the denture (B). Lower posterior teeth must be on or slightly inside the ridge (A).

Figure Seven

Teeth set too far inside the lower ridge and lingual flanges that remain too bulky encroach upon the tongue so that it dislodges the denture with the slightest movement (B). The tongue must be given adequate space (A). A

compromise between this principle and the one illustrated in Figure Six must be found.

Figure Eight

Cuspal inclines resist protrusive and lateral excursive movements enough to cause a lower denture to shift on a flat ridge producing discomfort, soreness, and instability (A). Posterior teeth with flat occlusal surfaces which offer no resistance to excursive movements should be selected if the ridge is flat (B).

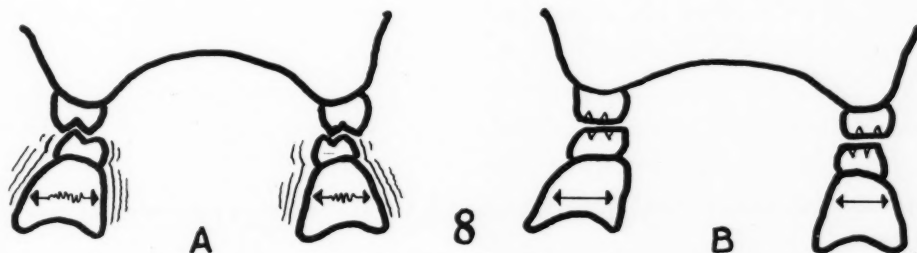


Figure Nine

When the denture is finished and inserted, the following steps must be completed to ensure success:

(A) Check the entire lingual flange for overextension using disclosing wax.

(B) After the mylohyoid ridge areas have been thoroughly adjusted, the distolingual flanges of the denture may be reduced and refined where they are too bulky.

(C) Check the labial flange for overextension using disclosing wax.

(D and E) If the patient complains of discomfort when the denture is pressed to place, the middle portion of the ridges and the mylohyoid ridge areas are the places most likely to cause trouble. Coat the tissue surface of the denture with disclosing wax and ask the patient to bite the denture into place until the discomfort is felt. Relieve the areas which show pink through the wax. Repeat until all pressure spots are relieved.

(F) The distobuccal flanges in the

region of the masseter muscle and the external oblique ridge may be tested for thickness and extent and adjusted in the same manner.

(G) Adjust the distal borders of the denture exactly to the line of muscle insertion over the retromolar pads. These areas are extremely sensitive. The slightest over or underextension will cause the denture to be unstable. If digital and visual examination leave some doubt, mark the distal borders of the dry denture with indelible pencil to determine where it

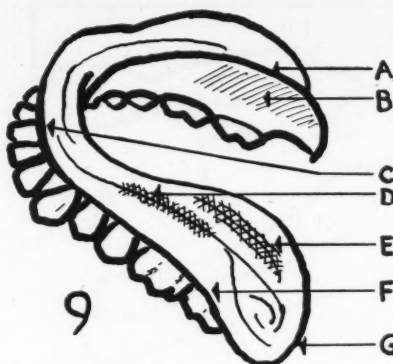
leaves its outline on the tissues when reinserted.

Conclusion

The whole denture must be checked for contour, thickness, extent, and fit. It may then be polished. No denture should ever have a rough or sharp place on it anywhere.

There is no such thing as a perfect impression and the need for careful adjustment can not be too strongly emphasized.

7734 Maryland Avenue



CLINICAL AND LABORATORY SUGGESTIONS

(See pages 176 and 177)

To: Clinical and Laboratory Suggestions Editor

Form to be used by Contributors

DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned. \$10 will be paid on publication for each suggestion that is used.

The EDITOR'S Page

ANY DENTIST who has broken a needle while making a mandibular injection is aware of a rather terrifying experience. The patient who has suffered the accident has a slightly delayed reaction that sets in as soon as he has been informed and comprehends the gravity of the situation. From such events mental anguish to the patient and the dentist stems, and malpractice suits are born.

It is agreed among surgeons that a sharp metallic object such as a fragment of a broken needle cannot be allowed to remain in the tissues in the region of the lingual aspect of the mandibular ramus. Fraser-Moodie¹ gives four convincing reasons why removal of the fragment "at the earliest opportunity" is imperative:

1) "*Mobility of Fragments*—The rapidity and the extent of movement of some fragments, especially those on the lingual aspect of the mandible, are quite remarkable. There are some which move on to the lateral pharyngeal wall and lie close to the large vessels of the neck, while others wander down into the submaxillary region. They have been known to travel into the infratemporal fossa and the base of the tongue.

2) "*Cicatrization*—Consequent on muscular action the continuous movement of fragments may produce cicatrization. This scarring in turn produces trismus, discomfort, dysphagia, and referred pain.

"This cicatrization may in itself present added difficulties at the time of removal. Not only does it hide the fragment, but it forms quite a formidable barrier to be penetrated by the locators or seekers.

3) "*Hemorrhage*—This may be a late sequel when a vessel is penetrated. One case in the series presented with an infected hematoma in the pterygoid space some four months after the needle was broken and lost.

4) "*The Psychologic Effect*—Considerable mental distress may be caused to the patient, and the physical change produced in a comparatively short time in a patient worrying about 'something stuck in the throat' is often most alarming."

The human tendency that prevails among most of us is to attempt to cover our mistakes. We develop proficiency in this "skill." As humiliating as it may be for us to do so we *must inform the patient if a broken mandibular needle remains buried in tissue*. Not to make such a disclosure places us in double jeopardy: we are hiding a condition that might endanger the patient and we are placing ourselves in a position that might lead to serious legal difficulties.

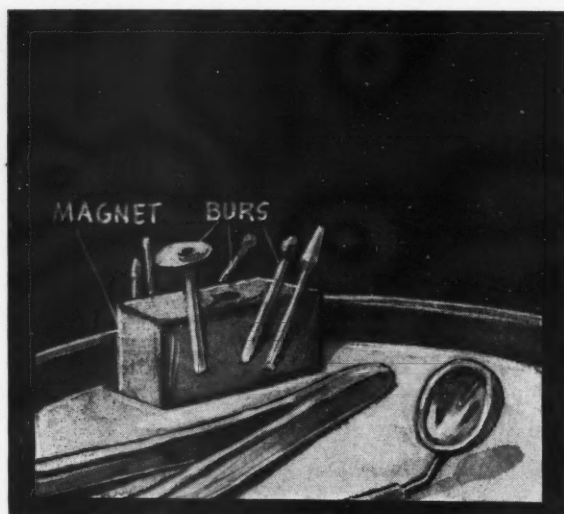
Courts and juries understand that accidents of many kinds befall human beings where there is neither malice nor negligence involved. However, courts and juries are not disposed to be tolerant when it can be shown that the dentist attempted to cover up a serious accident, such as not informing a patient that a needle fragment was present in his tissues. Any lawyer for a plaintiff could show without doubt that the dentist who did not inform the patient of the full nature of the situation was not using the "ordinary care, skill, and judgment" that is expected and required by every licensed dentist.

Every dentist should certainly have malpractice insurance. To practice even *one day* without such protection is foolhardy. Immediately after *any* kind of accident in the dental office the company that has written the insurance should be notified.

The recovery of a submerged needle fragment is not an operation to be undertaken by an excited or inept person. The tendency for the dentist who has had this unfortunate experience is to rush in under panic and slash and probe through the tissue into which the needle has disappeared. That is definitely not the required approach. The correct procedure is an immediate referral to an oral surgeon who is skilled and experienced in such operations.

¹Fraser-Moodie, W.: Recovery of Broken Needles, Br. D. J. 105:80 (Aug. 5) 1958.

1



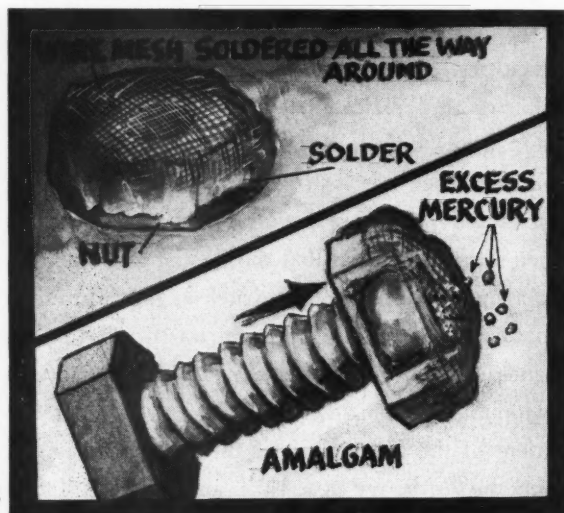
Clinical and Laboratory Suggestions

Magnet to Hold Burs

F. J. Hallberg, D.D.S., Reseda, California

1. A magnet 1 inch by 1¼ inch in size may be used on the bracket table to hold burs to keep them readily visible at all times.

2

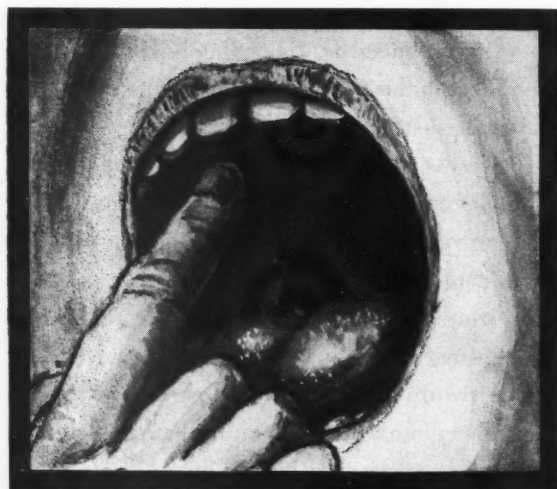


Mercury Expresser

S. M. Dooreck, D.D.S., Brooklyn, New York

2. Solder a piece of wire mesh over a large nut. When the amalgam is mixed, place it in this receptacle. When the bolt is placed in the nut and turned the excess mercury is expressed.

3



X-Raying Children

Edwin T. Coleman, D.D.S., Knoxville, Tennessee

3. To condition the child for his first x-ray examination the dentist should rub the palatal area and the floor of the mouth before placement of the film and explain to the child that the film will touch him in these areas.

READERS Are Urged to Collect \$10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10 on publication.

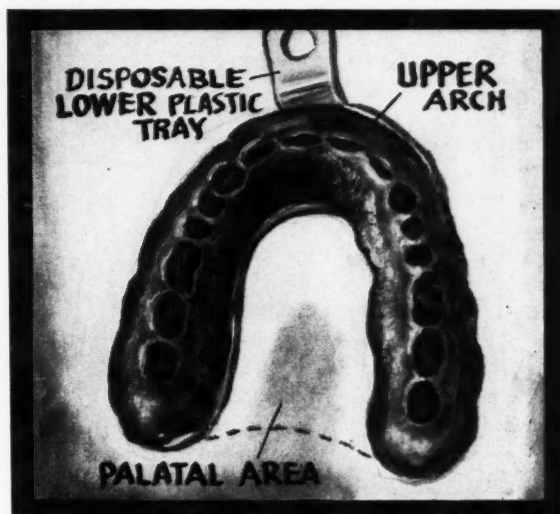
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

to SUGGESTIONS . . .

Full Upper Rubber Base Impression

M. I. Weisman, D.D.S., Augusta, Georgia

4. Use a full *lower* plastic tray when taking a rubber base impression of the upper arch. This will confine the material and prevent gagging.



4

Assuring Proper Contact Points

Thomas G. Ban, D.D.S., Van Nuys, California

5. To assure a satisfactory contact point dip a brush in chloroform and roll it over a piece of gutta percha. Apply a thin film of this chloropercha on the proximal surface of the casting. When the casting is placed on the tooth any binding will be registered as a spot where the gold is uncovered.

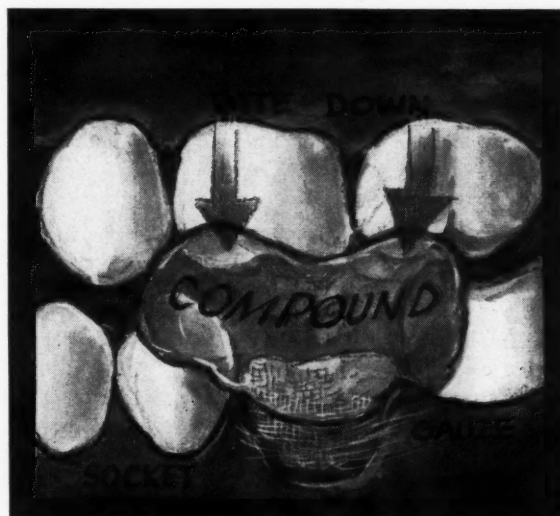


5

Hemorrhage Control

Jesse Flashner, D.D.S., Flushing, New York

6. Soften a block of modeling compound. Cover the socket with sterile gauze. Have the patient bite on the softening compound. The splint formed when the compound hardens will act as a pressure appliance to control the bleeding.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 174 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



Failure to Gain Weight

Faulty fat absorption is often responsible for stationary weight in a seemingly healthy child receiving adequate calories. The gross and microscopic appearance of the stools is normal even with a masked steatorrhea in premature infants with latent steatorrhea. Increased caloric intake through additional carbohydrate, protein, or even fat, is the recommended treatment for steatorrhea.

A congenital or acquired failure of the anabolic enzyme system results in impaired nitrogen retention. Cystic fibrosis of the pancreas is the most familiar example of nitrogen loss. With chronic protein deficiency, known as malignant malnutrition, both digestive and other body enzymes are lacking. As a result tissue synthesis throughout the body is impaired. Only 32 per cent of the nitrogen intake may be absorbed as opposed to normal absorption of 80 to 90 per cent. The urinary loss may amount to as much as .82 grams per day with an intake of only 1.42 grams.

Protein starvation is best treated by administering generous amounts of protein. When food of any kind has been withheld, however, the adaptive enzymes responsible for the metabolism deteriorate and tolerance for that particular food is reduced. When protein intake is increased too rapidly, the nonprotein nitrogen content of the blood may rise to pathologic levels for some days. Introduction of protein by the oral route is preferable to intravenous protein hydrolystates.

Metabolic anomalies interfere with weight gain by causing impaired appetite or masked caloric loss in the excreta. Serious caloric loss in the stools as well as in urine is caused by diabetes mellitus, nephrosis, and frequent infections.

With silent metabolic anomalies, the symptoms are insidious, confined largely to anorexia, with little vomiting. These disorders include idiopathic hypochloremic renal acidosis, idiopathic hypercalcemia, and galactosemia. Metabolic anomalies associated

MEDICINE *and the* **Biologic Sciences**



with aminoaciduria should also be considered in diagnosis.

Rumination may occasionally account for failure to gain weight. Accurate records may reveal an unexpected discrepancy between food given and food ingested.

Holt, L. Emmett: *Failure to Gain Weight*, *Am. J. Clin. Nutrition* 5:500-505 (August) 1957.



Auto Accident Injuries

Nearly 75 per cent of persons involved in injury-producing automobile accidents have lesions. Approximately half of those injured require hospitalization. The most frequently injured body area is the head.

It is essential that thorough examination of all body areas be undertaken because over two-thirds of crash victims have lesions in two or more body areas. About half of the injured occupants have head injuries in combination with lesions in another area, most commonly the legs.

Most injuries in crashes are produced by objects in the forward position of the car. The steering wheel and ejection of the occupant from the car are the most frequent causes of damage.

Other causes are, in decreasing order of importance as to frequency and severity of injuries, instrument panel, windshield, upper portion of the front seat backrest, door structures, lower portion of the front seat backrest, front corner post, flying glass, top structures, and rear view mirror.

Virtually all manufacturers of 1956 cars adopted alterations to reduce incidence of occupant ejection. Comparison of accident and injury data between older car models and 1956 models shows improved safety. Redesigning has reduced by about one-third the incidence of doors opening on crash. Occupant ejection has diminished 49 per cent. A decrease of 29 per cent in dangerous to fatal grade injuries probably is the result of the lessened risk of ejection.

Seat belts have definite prophylactic value. Injuries incurred in 81 accidents of cars without seat belts and in 81 similar crashes of automobiles equipped with the safety device were compared. Approximately 75 per cent of persons without seat belts were injured.

Changes that decrease frequency of injury from interior objects have been adopted by some manufacturers. These changes include padded instrument panels and improved steering assembly design.

Braunstein, Paul W.; Moore, John O.; and Wade, Preston A.: *Preliminary Findings on the Effect of Automotive Safety Design on Injury Patterns*, *Surg. Gynec. & Obst.* 105:257-263 (August) 1957.



Gallstones in Young Women

Early cholecystectomy is advisable for patients with gallbladder disease. This is true because complications of gallbladder disease and associated disorders of the heart, lungs, and kidneys make operation more difficult. Gallstones are common in women during the third decade of life. Stones seldom appear in men until later in life.

Probably the most important causes
(Continued on page 181)

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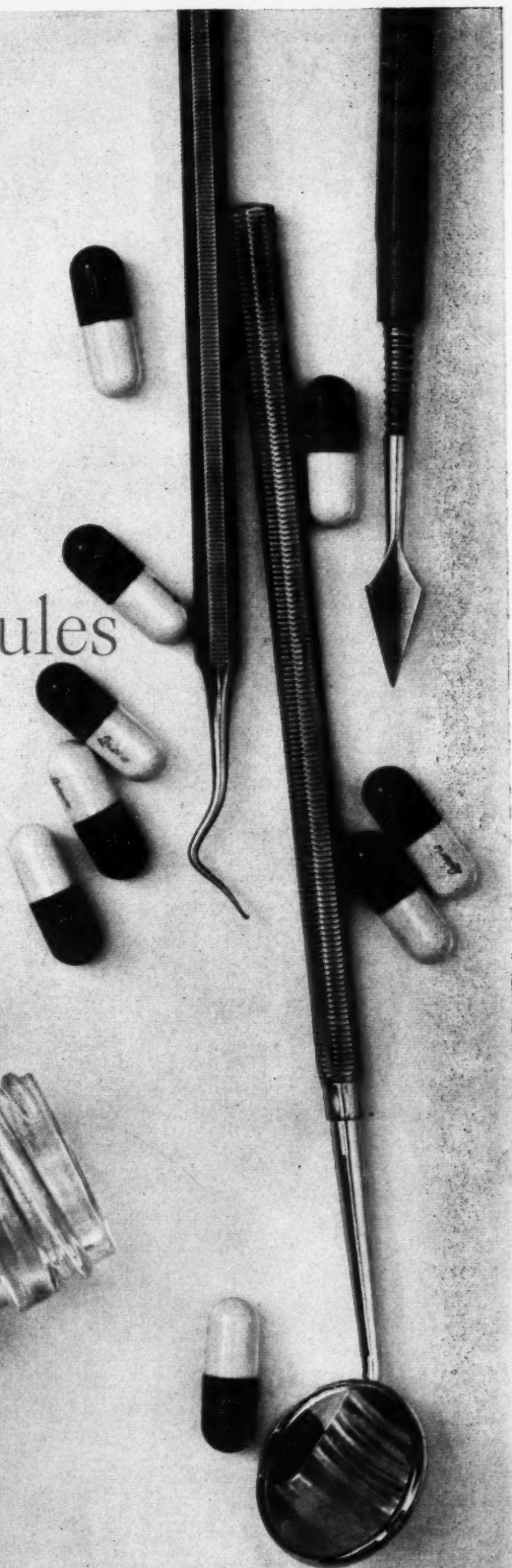
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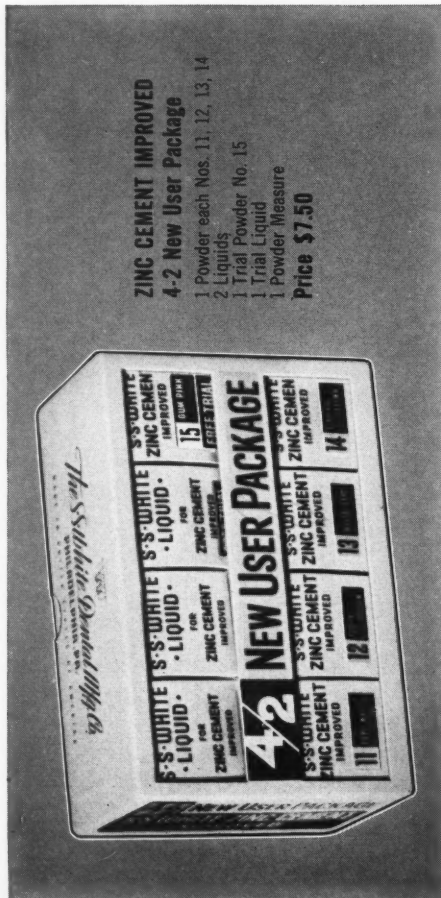


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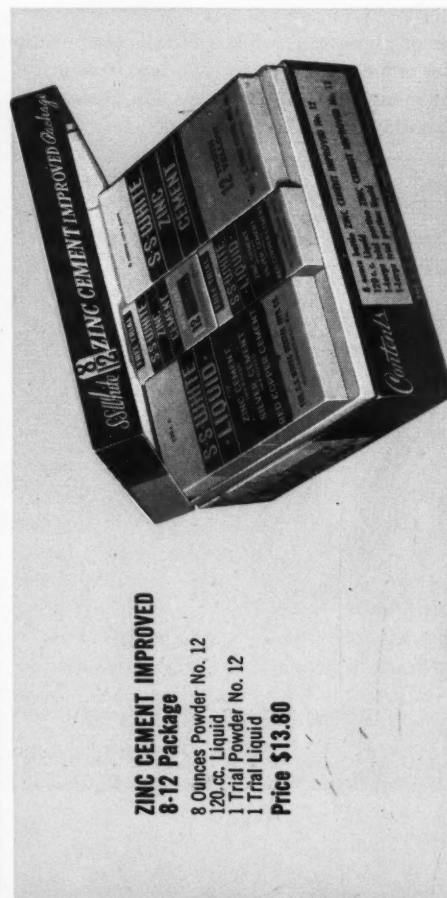
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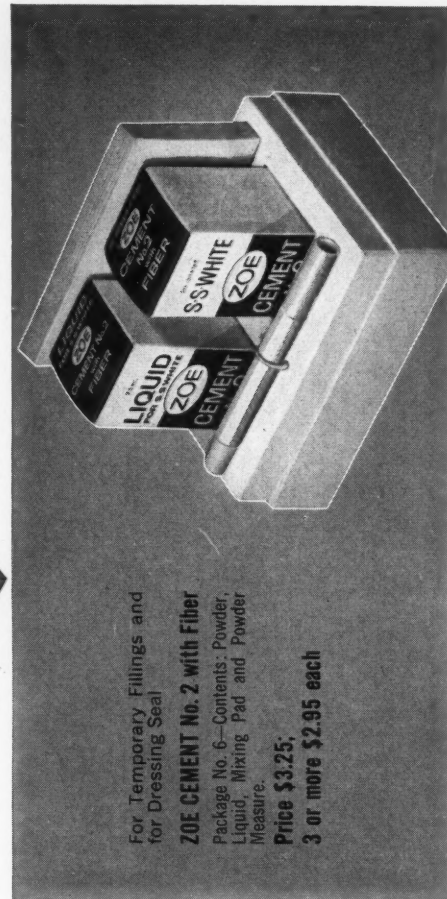
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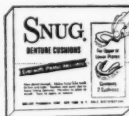
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for the early appearance of cholelithiasis in women are the metabolic and functional changes during pregnancy that favor the precipitation of cholesterol gallstones. While symptoms of gallbladder disease may begin during pregnancy, severe attacks are more probable in the postpartum period. Young women with cholelithiasis are as often slender as obese and as often brunet as blond.

The attacks of pain in these patients tend to be brief and severe. Often discomfort is localized to the epigastrium without extension to the right upper abdomen. Relationship of pain to diet is inconstant. In many instances, attacks awaken the patient during the night or begin during periods of fatigue or anxiety.

Because of the youth of the patient and the brevity and atypical location of the pain, cholelithiasis in the third decade is sometimes confused with peptic ulcer, or gastroenteritis. When the correct diagnosis is made, cholecystectomy should be done to prevent future complications. Operative mortality and morbidity are very low. Usually the gallbladder will contain many small, round radiolucent cholesterol calculi. Stones are rarely recovered from the common duct. Post-operatively, biliary symptoms are relieved. Dyspepsia attributable to loss of the gallbladder is infrequent.

Sparkman, Robert S.: *Gallstones in Young Women*, Ann. Surg. 145:813-824 (July) 1957.



Air Travel

There are some diseases which preclude air travel, or necessitate precautions during travel. Physicians should determine whether patients who are prospective air passengers are fit to fly. Also patients should be advised regarding management of air-sickness, barotrauma, and air hunger.

If the supply of oxygen to the lungs of the mechanical expansion of gases in the body is obstructed, air travel is not safe. A patient with artificial pneumothorax may fly if the mediastinum is fixed and a refill has
(Continued on page 182)

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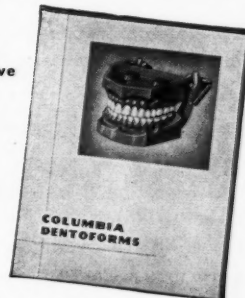
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Bleeding Gums Respond to Oxygenation

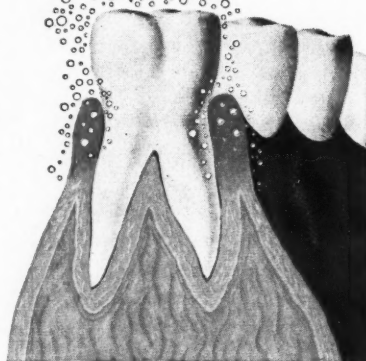
Recent studies interestingly point up the fact that inflamed gingival tissues need and respond to oxygenation.¹

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At the first sign of bleeding gums, gingival recession or tooth mobility, use, recommend and prescribe



1. Oxygen uptake by normal and inflamed gingiva and saliva. Schrader and Schrader. *Helv. odont. acta.* 1:13-16, (April) 1957.

2. Behrman, S. J.; Fater, S. B.; Grodberg, D. L.; An Evaluation of Oxygenating Agents in the Treatment of Gingival Inflammation. *J. Dent. Med.*, (October) 1958.

3. The New York Hospital—Cornell Medical Center. Presented as a Scientific Exhibit at the American Dental Association Annual Session, (November) 1957.

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not been given within ten days.

Intestinal gases expand about 50 per cent at 10,000 feet and 100 per cent at 18,000 feet. Therefore, patients who have recently had enteric surgery may be poor air passengers. Sudden decompression could cause severe complications.

Potential passengers with coronary artery disease, anemia, heart failure, or respiratory embarrassment should be carefully appraised. Such patients should notify the carrier in advance of flight and carry a certificate of fitness. Slight deficiency of circulat-

ing oxygen at altitudes of 8,000 to 14,000 feet, may cause hemolysis in persons with sickle-cell anemia.

Before a person with a contagious disease may be transported across a state line, permission must be obtained from public health officials. Unless physical isolation can be assured, patients with malodorous conditions, gross disfigurements, or other unpleasant characteristics should not be transported by public air carrier.

Epileptics are more prone to seizures when hypoxic in aircraft. Diabetics must have a syringe and in-

sulin available in the passenger cabin.

A woman in the ninth month of pregnancy must present a certificate signed by a physician stating that delivery will not occur for three days. Infants less than 8 weeks old generally are not transported by commercial planes.

Air sickness is 5 to 10 times more frequent among children under 5 years of age than among adults and is much more common among women than among men. Reassurance and antiemetics prevent or reduce discomfort.

Ear trouble is also most common among children because many young persons cannot be taught to make oropharyngeal adjustments during descent. Passengers must yawn or swallow during descent to equalize pressure between the middle ear and the atmosphere. Equalization of pressure of the accessory nasal passages is basically automatic but may be obstructed by swollen or redundant mucosa or nasal polyps.

Upper respiratory infection is the chief cause of aerotitis media and aerosinusitis. Persons with acute infections, allergic rhinitis, or nasal polyposis who must fly should use a nasal vasoconstrictor or decongestant during flight and, particularly, between ascent and descent.

Symptoms of air hunger are relieved by oxygen therapy. Dyspneic type of respiration due to apprehension, which is frequently misdiagnosed as air hunger, is alleviated by carbon-dioxide inhalations or breath holding.

Spiegel, Frederick: *The Physician's Role in Air Travel*, JAMA 165:205-208 (August 10) 1957.



Mongolism

The deformities evident in a Mongolian idiot at birth involve tissues that differentiate during the eighth week of gestation. These are the eyes, nasal bones, heart, and little finger. Apparently a potentially normal embryo is damaged early during pregnancy by maternal stress.

The incidence of mongolism increases with age of the mothers. The high order of birth of babies with the defect is attributable to the relatively advanced maternal age. It is not a significant causative factor.

The interval between births of a Mongoloid infant and of the preceding sibling is often unusually long. Mothers of the deformed babies are not less fertile than other women of similar ages but frequently have pregnancies terminating in miscarriage or stillbirth before the Mongoloid infant is born. Adverse reproductive factors evidently exist before the child with mongolism is conceived.

Organic heart disease is four times more common among women of the same ages who give birth to infants without the defect. Rheumatic heart disease is the most common cardiac disorder.

The relation of mongolism to advanced maternal age suggests that chronic disorders are more significant than acute stress in the causation. Many diseases that may adversely affect the embryo are accentuated by aging. The incidence of chronic disorders, especially heart disease and gynecologic disturbances, is high among mothers of Mongoloid infants. Endocrine, gynecologic, and systemic disease probably have a cumulative effect on the embryo.

Ingalls, Theodore, H.; Babbott, Joan; and Philbrook, Randolph: The Mothers of Mongoloid Babies, Am. J. Obst. & Gynec. 74:572-581. (July) 1957.

Contra-Angles



Safer Foods for All

Food growing, processing, and distributing is our largest industry. It is one business that will never go out of business. Methods of farming, of preparing, and selling foods have improved. One thing, however, is a backward step in many cases: the use of chemical additives to improve the appearance and longevity of foods may be a health hazard. I realize that anyone who questions these practices and technologic "advances" is likely to find himself labelled a "food faddist."

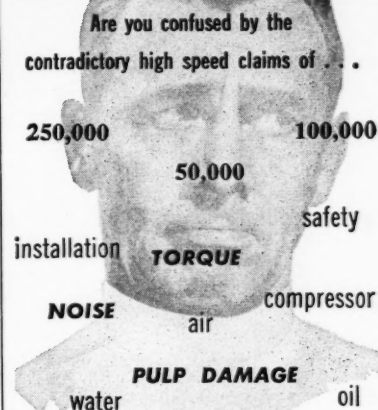
I have never traced the origin of the expression "food faddist" but I suspect that it came out of the fertile cerebral hemispheres of some employee of the food industry. To use emotion-packed words and to affix labels of scorn are old devices that have been used for hundreds of years to make people look bad. "Egghead," "radical," "crackpot," "lush" are a few examples of recent origin.

The trick is to hang an complimentary tag on something or someone with the hope that people will mistake the symbol for the thing. The semantic experts have tried to tell us that the name for something is not the thing itself. The slicksters are hired to make bad things sound like good things by giving them a pretty label. The character assassins are hired to think up labels that will bring disdain and ridicule upon the people upon whom the labels are hung. "Food faddist" is one such tag that is intended to discredit.

Almost any person has the sense to understand that the chemical substances of the body (blood, hormones, antibodies, secretions) are

(Continued on page 186)

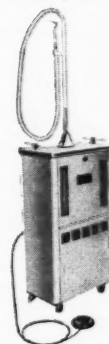
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The mouth is a mirror that reflects the manifestations of many systemic diseases. One hundred of these system diseases are included on ORAL DIAGNOSTIC SIGNS. The lesions that may appear on the lips, buccal mucosa, tongue, gingiva, and palate are described on the chart.

The dentist encounters lesions of the mouth that should alert him to consider diseases of nutritional or hormonal imbalance, of malignancy, of bacterial or viral origin. In such cases, the dentist should refer the patient to the physician for more thorough examination and treatment. The physician observes lesions of the

mouth that may be of mechanical or local infective origin. In such cases, the physician should refer the patient to the dentist for definitive treatment.

The dentist, because he often sees the patient before the physician sees him, has the opportunity to become an important member of the health team by detecting the early expressions of systemic disease. Early detection and treatment of these conditions will save lives!

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ORAL DIAGNOSTIC SIGNS has been prepared by Edward J. Ryan, D.D.S., Editor of Dental Digest, and E. Cheraskin, M.D., D.M.D., Professor of Oral Medicine, University of Alabama.

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100 diseases are classified under these ten categories on the chart

1. Diseases Due to Biologic Agents
2. Physical Agents
3. Chemical Agents
4. Neoplasms
5. Cysts
6. Hormonal Disturbances
7. Developmental Disturbances
8. Nutritional Disturbances
9. Reactions to Stress and Antigenic Substances
10. Miscellaneous Disorders



Preparation for a veneer facing

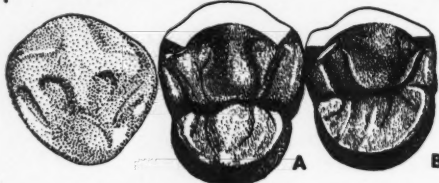


INCORRECT

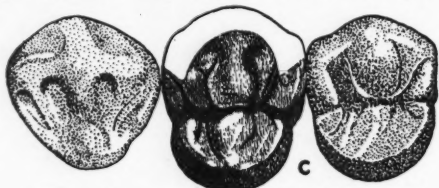
A full crown preparation made with a labial or buccal shoulder to accommodate a veneer should have the shoulder carried back well into the interproximal areas.



CORRECT



If the shoulder of the preparation terminates near the axial angles, a casting which would properly support and retain the veneer cannot be formed without showing metal on the buccal surface (see A). Removal of the metal on the axial angles reduces the strength and retention contributed to the veneer by the casting (see B).



Extension of the shoulder into the interproximal areas allows enough room for the gold casting to be designed to aid support and retention of the veneer without interproximal display of metal (see C).

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A Plastic for Fractures

An orthopedic surgeon of the Prince of Wales Division, Sydney Hospital, Australia, has developed a technique in which a cold-setting industrial plastic is used to hold fractured bones firmly together thus replacing the usual pins or

plates. The technique has been used successfully in 17 or 25 animals and according to the superintendent of the Hospital, may prove useful in man.

From *Medical Science* 4:31 (July 10) 1958.

replenished from what is taken into the body as food. If the food that is taken into the *biomachine* is inadequate or deficient in quality the *biomachine* cannot run well or for long. The fellow who buys high-octane gasoline for his car is aware of this principle. He often fails to carry the analogy to fit his own body.

If someone markets a battery additive that is worthless or a gasoline of lower grade than it is supposed to be he may expect a visit from agents of the Federal Trade Commission. If one tries fraudulent practice through the mails he may count on a call from Postal Inspectors. If a company uses unfair tactics to crush competition it can be sure that the provisions of the Sherman Antitrust Act will be invoked. (By the way, professional men and organizations are *not* exempt from the penalties of the Sherman Act.)

Up until the present anybody could put anything into food and then the Government was required to prove that the additives were harmful before a cease and desist order was entered by the Food and Drug Administration. That is now changed. The public will be better protected.

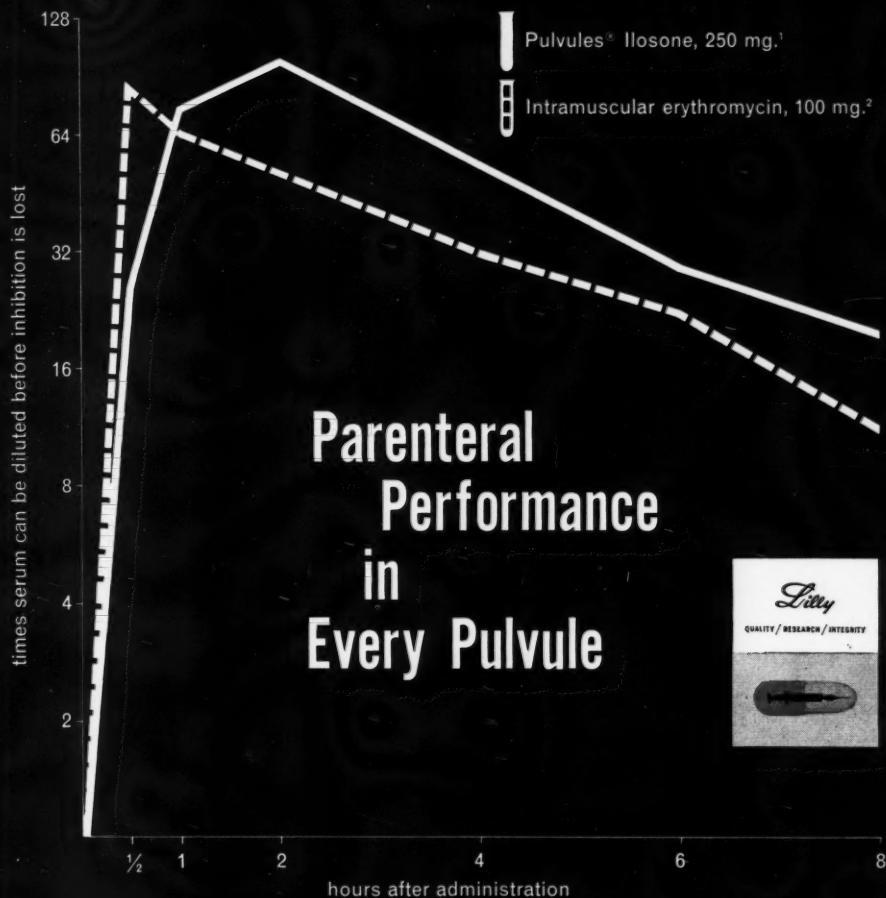
I am indebted to my old friend, Congressman Leo E. Allen of Illinois for sending me the 533 page proceedings of the Congressional hearings on food additives. For eleven days (July and August, 1957, April 1958) witnesses appeared before the committee to express their views concerning legislation to strengthen the food and drug act.

One witness gave this dramatic testimony:

"Their [chemists in the food industry] jobs obviously include devising stabilizers, moistening agents, coatings, bleaches, emulsifiers, neutralizers, preservatives, antioxidants, modifiers, and a long list of other chemical considerations.

"The Assistant Secretary of Health, Education, and Welfare last year pointed up the problem quite well when he told the American Chemical Society that:

"Advances in food chemistry and
(Continued on page 188)



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1. Antibiotic Med. & Clin. Therapy, 5:609, 1958.

2. Data from Antibiotics Annual, p. 269, 1954-1955.

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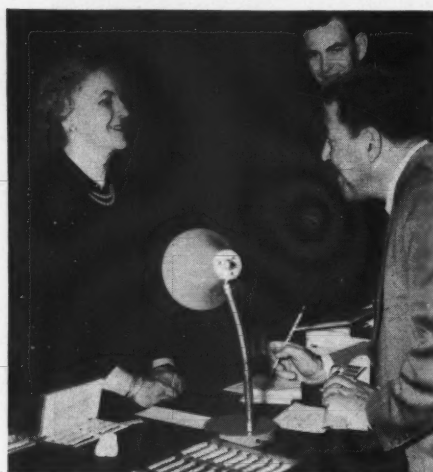


Fig. 1. Dentist examining patient at close range during detectability test.

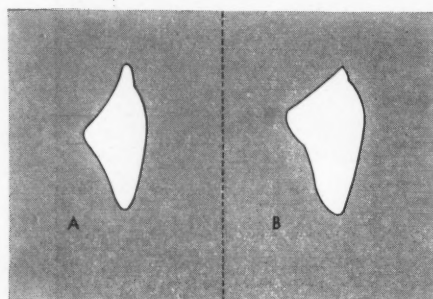


Fig. 2. Dura-Blend now offers choice of profile: (A) Characteristic of new moulds; (B) Typical of many existing moulds.



Fig. 3. New Dura-Blend shade guide has three additional shades. Rugged plastic handles are designed for maximum convenience in matching.

New Moulds New Shades in Dura-Blend

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Three new shades, M61, M65, M69, have been added to increase Dura-Blend's shade-matching superiority. M61 is quite light and bright, M65, similar but darker, and M69, quite grey. New shade guide proved first choice in match to natural teeth 44 percent more often than the shade guide which scored second in this respect.

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food technology have brought about a tremendous increase in the use of various kinds of additives, but there is no law which requires that these be tested and found safe to the consumer before they are put on the market. The law is not preventive—it is merely punitive, imposing penalties on the use of those additives which have been proved to be harmful. In very many cases it is difficult, if not impossible to secure such proof. Additives of questionable safety may continue to be used since evidence is lacking of any harmfulness. The backing of research needed to establish safety of all these materials has grown to the point where it far exceeds the resources and scientific personnel of any Government agency. In fact, a recent report on the FDA research program on coal-tar colors says that it would take 25 years for the present staff to complete the studies in that one field which should now be undertaken."

"Whether the purpose of injecting these agents into food [is] to provide eye appeal or toothsome or solubility, none of these in itself carries with it a warranty of wholesomeness or guaranty against cumulative toxicity.

"In 17 years, more than 25,000 chemical food additives or substances have been considered for use in food intended for your consumption or mine. Some 20,000 of these 25,000 have been eliminated as acutely toxic.

"Another 4,000 have been eliminated as subacute and chronic toxic. Still another 600 have been eliminated for other reasons, leaving 400 others in use for one or the other of these reasons:

"1. 150 in use without adequate testing.

"2. 100 safe within limits of use.

"3. 150 harmless and are now in use.

"[This] means that of the 25,000 food additives, at least 300 substances are suspect. It is difficult to understand how an additive can be 'safe within limits of use' and still not be unsafe also within limits. But it is not difficult to understand the potentials of 150

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others which are being used every day without adequate testing.

"There has been much discussion of the possibility or probability of promotion of cancer. If such suspicion be well-grounded, these 150 untested additives seem to be the villains.

"Because these 150 are not adjudged safe and because no agency seems empowered by statute to separate the safe from the unsafe, you have these bills on the table.

"We have taken note of the several hearings during 7 or more years in an effort to guarantee consumer health safety. We also note that more than one bill each this year has been introduced by several sponsors.

"We are convinced that these several bills represent efforts to phrase the measures in their best and most comprehensive terms. This, we recognize as a serious attempt to enact legislation this year.

"Included in this number are Representatives James J. Delaney, chairman of the one-time Select Committee on Chemical Food Additives who performed great service in this cause, and Mrs. Leonor Sullivan whose bill is similar to that of Mr. Delaney.

"The sponsor of each bill before your committee has earned much credit for presenting a measure on this vital issue.

"These bills are reasonable. We can only view opposition to them, direct or indirect, as an unfriendly stand on the good and welfare of consumers in general.

"In a highly competitive world where balance sheets, sales volume, annual reports and dividend payments are prestige items with processors and handlers, the first to burst forth with a new slogan, gadget, label, claim with the best pop-crackle jim-crack for the family youngster also gets the jump on the competitors.

"This determination to be first to the consumer's purse could be more easily tolerated if we knew for a fact that some additives do not cause bladder cancer, skin cancer, stomach cancer or any other malignancy.

"Now is the time to empower the Department of Health, Education, and Welfare to be authorized and directed to get the programs outlined in these bills started.

"Most important is to realize that, in the minds of the experts, there is no safe dose of a cancer-producing chemical.

"We read the news of findings of authorities who say cancer, under certain conditions of smoking, is possible. We are warned about tars in cigarettes and we are told of the great risk from fallout in atomic bombs.

"The 'atomic bombs' which go into our stomachs we delay doing something about. These bills are not 'class legislation.' They affect and include every person, without exception.

"A report on this legislation even this year, will be a half century behind the time the original pure food bill was enacted.

"I notice some bills defer the effective date 1 year beyond time of enactment. This is too long. Six months would appear to be ample time to accommodate all parties.

"There doubtless will be those who will say that the district courts are the proper place for judicial review. Others will say it should be the appeals court. And others will go for declaratory judgments. Then the grandfather's clause will get some place in the discussions. Whatever in the committee's judgment will promote the beneficial effects of this legislation and with the least delay, that is our preference.

"The fact is that today all of us are walking chemical additive containers. Until all such additives have been pretested, we do not know whether these additives will show up years hence to prove our undoing, whether children today will reap the full ill-effects promptly or after arriving at adulthood."

On 8 September 1958 the Congress passed the food additive amendment and it became effective on 6 March 1959. According to *Science* (certainly no crackpot publication):

"The amendment shifts the bur-

(Continued on page 192)



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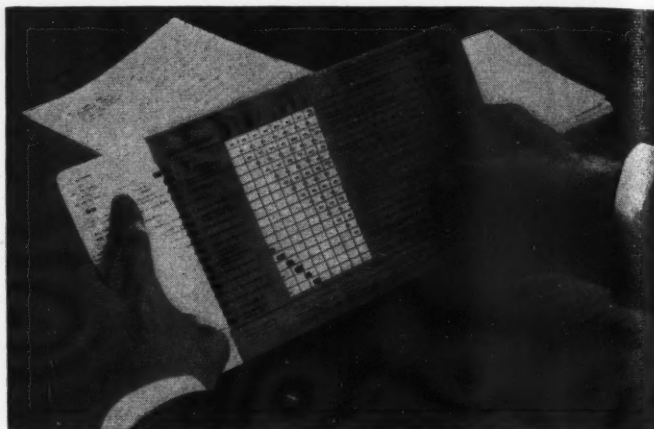
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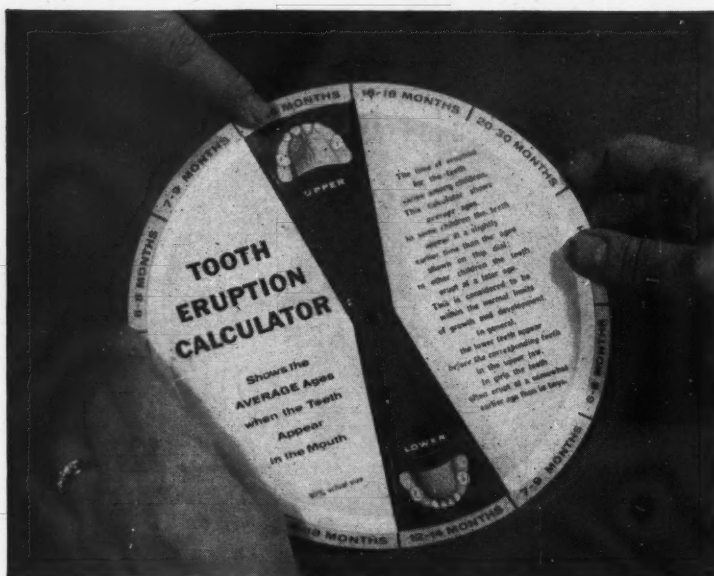
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Dental Digest

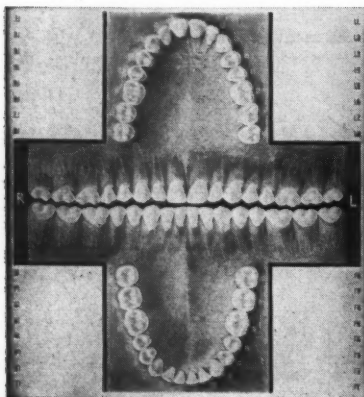
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den of proving the safety of new additives from the government to the producer and requires the producer to get a favorable ruling about the additive *before* it is introduced for public use Scientific experts will thus have a large responsibility under the terms of the amendment This procedure will put it up to the scientists to see that no potentially dangerous additives escape their vigilance, that the barn door is locked first."

All hail to the "food faddists!"

—E.J.R.

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